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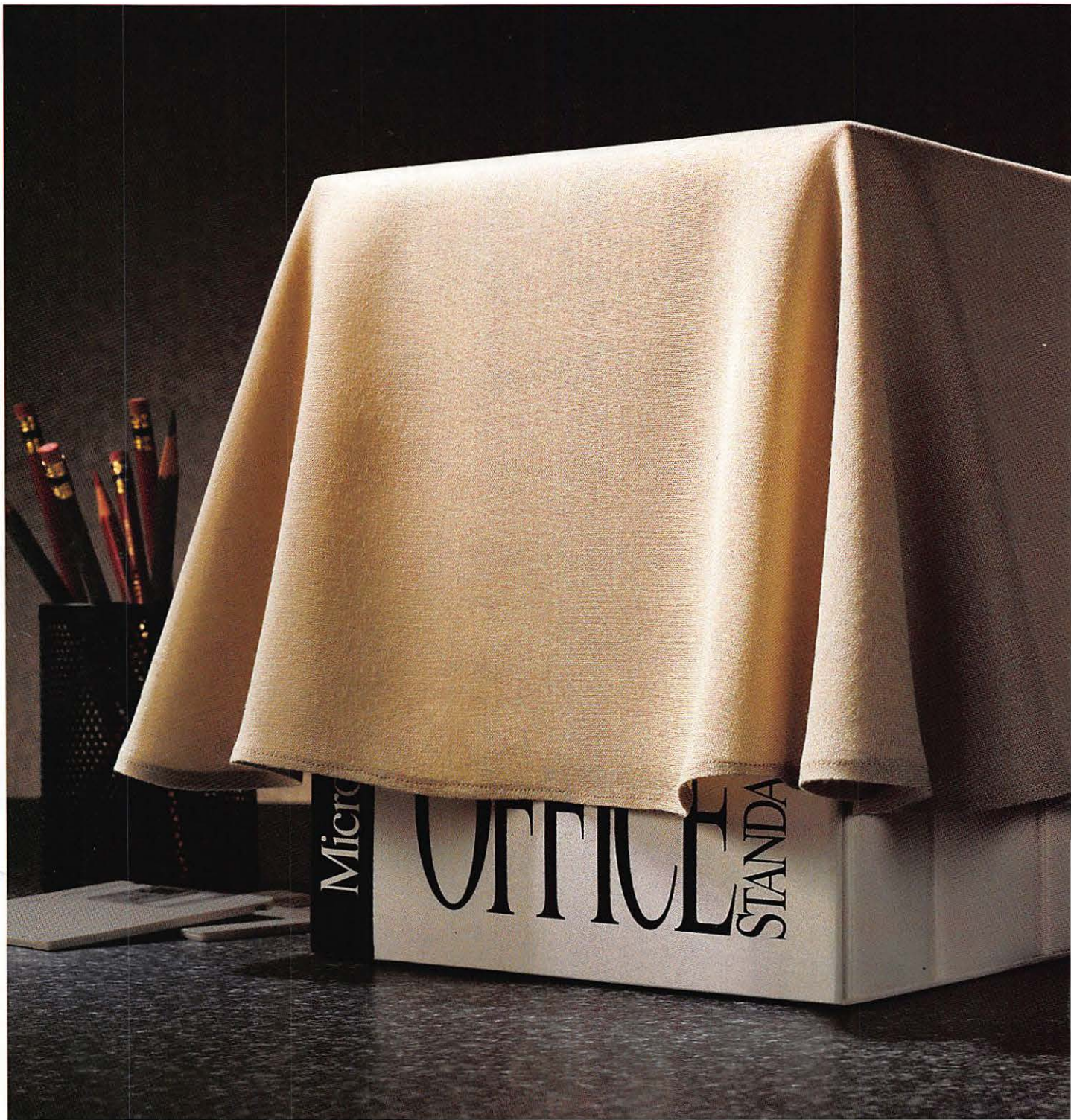
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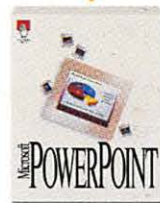
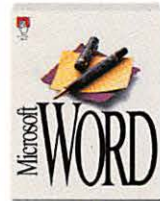
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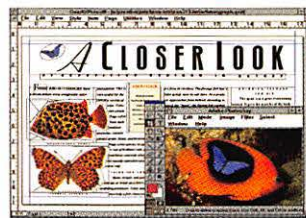


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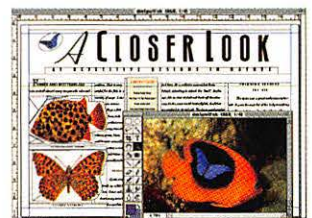


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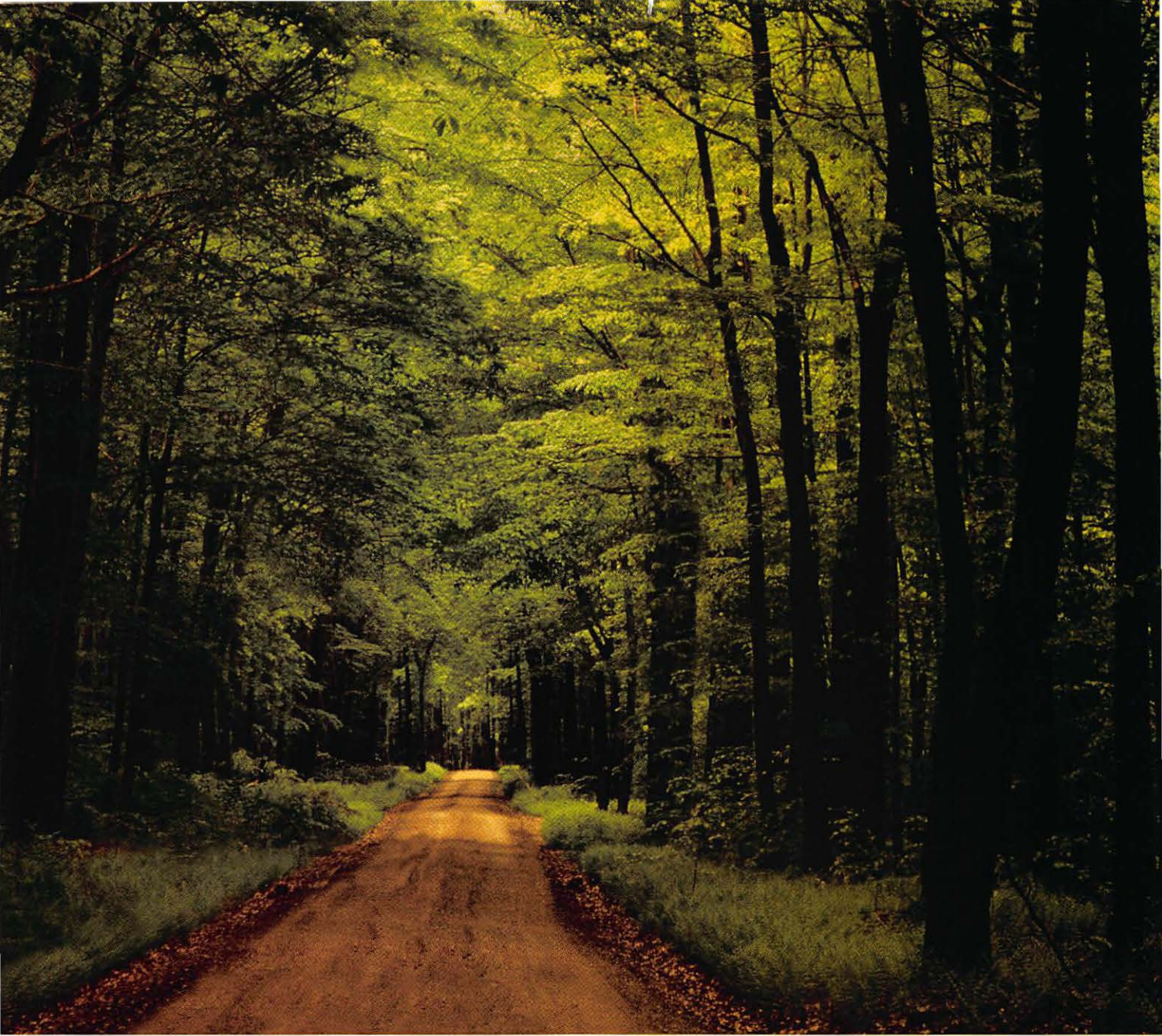
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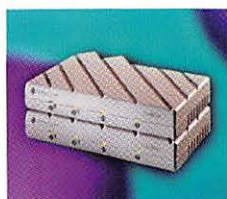
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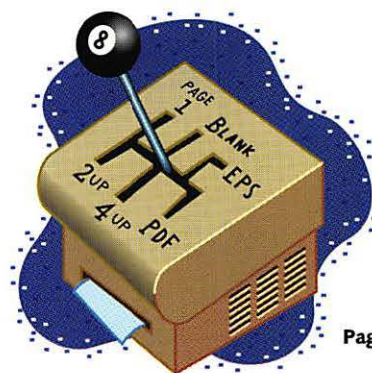
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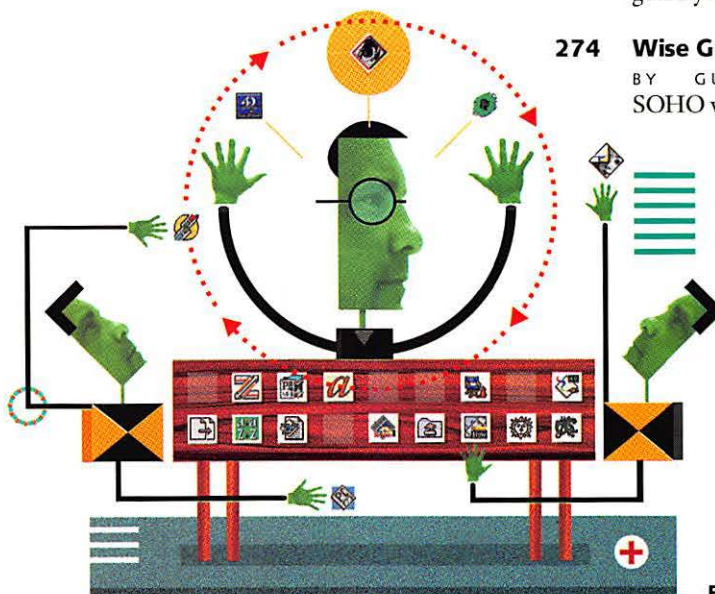
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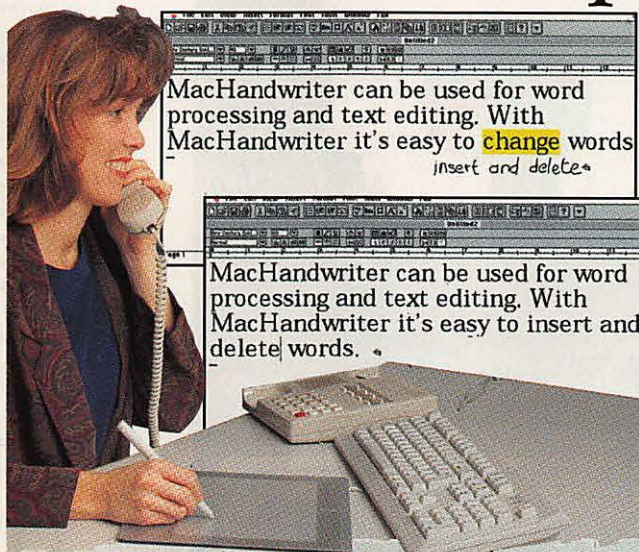
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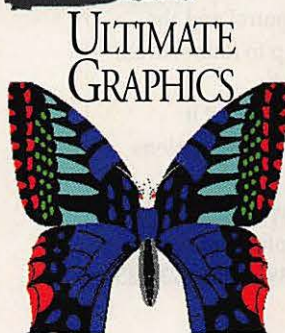
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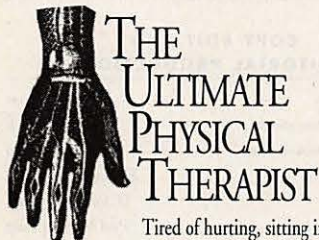
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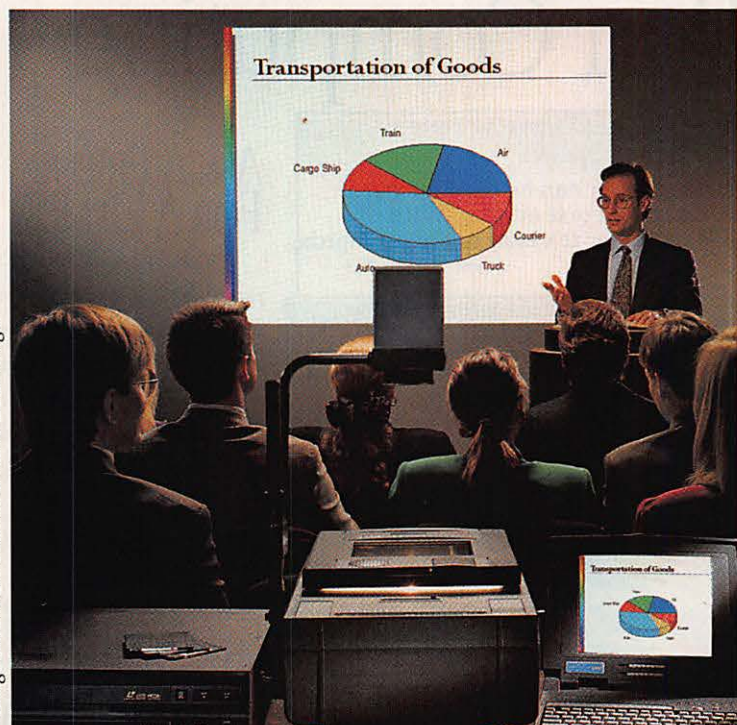


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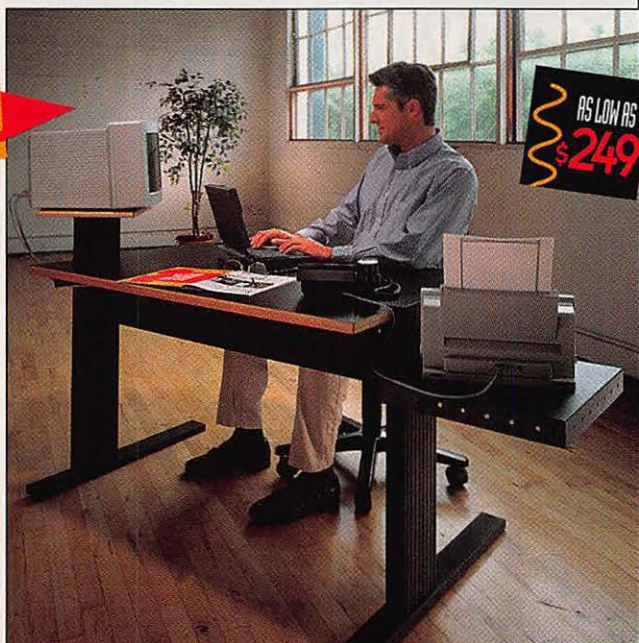


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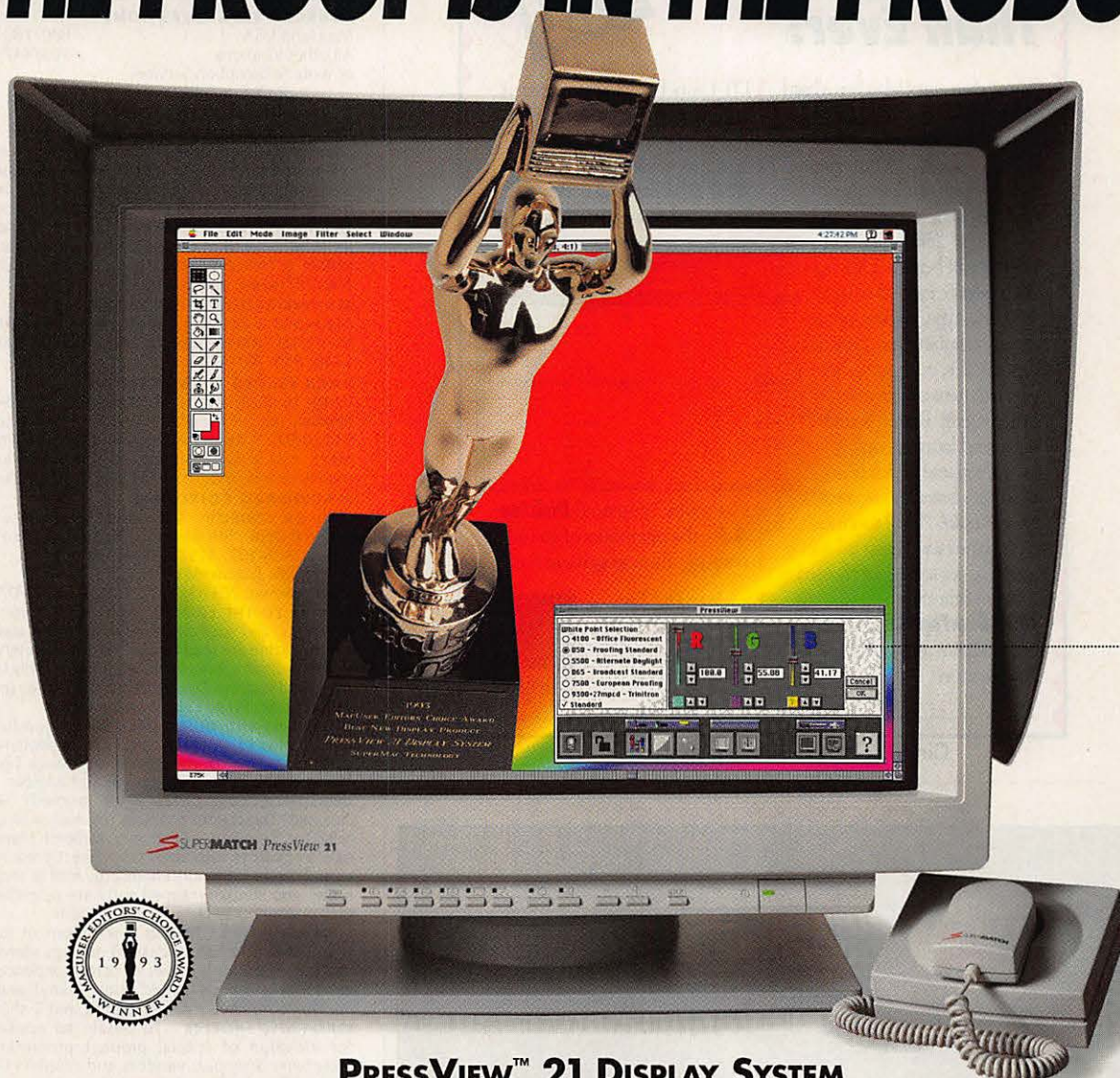
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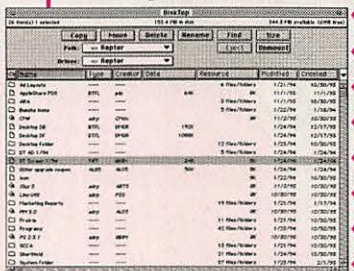


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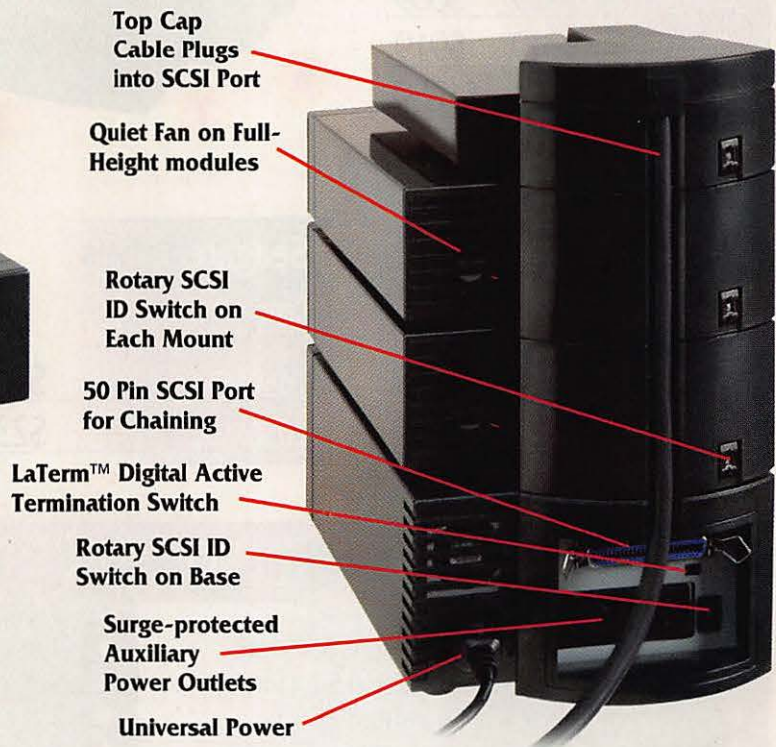
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### 2 Quantum 2.5" Drives

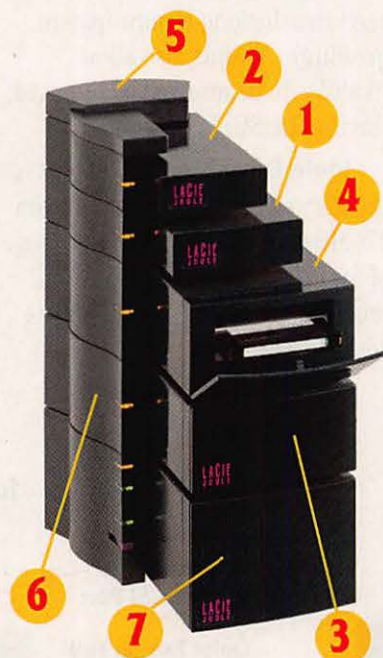
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# Once and Future Classic

*The Mac's original design is no more. How to resurrect it?*

SOMETIME IN EARLY WINTER, the Color Classic vanished from the U.S. market. Just as it was discontinued in the United States, a faster version called the Color Classic II was introduced in Japan (and is still available there). While everyone was distracted by the pyrotechnics of the Power Macintosh introduction, the ancestor of all Macs faded from view. Along with the Mac's system software, the Classic's charismatic design represented the essence of the Macintosh computing experience.

After the Power Macintosh intros in mid-March, it dawned on me that Apple no longer sells anything that looks like the original Mac. I felt a strange sense of loss. Why was the Color Classic killed? Why didn't it succeed? How could Apple create a new Classic that could recapture buyers' interest and the Macintosh community's loyal admiration?

## The Fall of the Classic

There's nothing mysterious about the Classic's demise, according to the Apple people I talked to. Apple's customers prefer other Macs. Despite being somewhat more expensive, the big all-in-one models such as the Performa 550 and LC 520 are very successful due to their larger screens and built-in CD-ROM drives. Economy-minded buyers can get an entire LC III system with a (larger) 14-inch monitor for under \$1000—around the best price for a Color Classic. The Classic also couldn't accommodate a number of standard components that buyers want in a low-cost personal computer. Buyers expect color, and the education and home markets want CD-ROM drives. Because of lower production volumes, the Color Classic's 9-inch monitor costs as much as or more than the 14-inch monitors sold with most computers. A standard CD-ROM drive wouldn't fit into the Classic's case. The Classic had become an expensive novelty that didn't offer as much value to buyers as other, feature-laden (if more prosaic-looking) Mac models.

I'm not doubting the wisdom of Mac

buyers, or Apple's understanding of its customers. Most of the Classic's practical virtues live on in other Mac models, but through pragmatism we lost the emblematic cabinet design and something else—personality, character, and tradition.

## The Lost Icon

The Classic had a personality. Every other desktop computer is a faceless clone. Put the Classic in a room with other desktop PCs and it looks alive, while all the other boxes sit like dull automatons. The Classic's physical demeanor meshed perfectly with the Mac's mission. The original Macintosh wasn't trying to be another muscle-bound three-box computer. It was the most human of computers, relying on intelligence and approachability instead of brute strength. The compact

One of the outstanding virtues of the original Mac was its plug-and-play capability. Nearly ten years after the original Mac came out, Compaq has begun trumpeting the virtues of this simple-but-brilliant design philosophy. And the company promises to deliver it real soon now, just as soon as Microsoft delivers the Chicago version of Windows, which is delayed—again. Similar to the other ways PCs have imitated the Macintosh, this version of plug and play will probably be a kludgy add-on for some PCs, and nothing like the ground-up integration built into every Mac.

Of course, plug and play lives on in all current Macs, but the most committed plug-and-play models come as a single box, like the original Mac. This eliminates cables between the monitor and the system box, and makes it unnecessary for users to learn about and choose between monitors because the display is integrated into the cabinet.

There are still all-in-one Macs, including the LC 575, LC 520, and Performa 520. These highly successful machines are like the Classic on steroids. But they have no character, and they don't evoke the response that a Classic Mac did. Because their designers contoured the cases to look as if the monitor could be separated, these computers seem obsequious or unsure of themselves.

Apple should redesign these one-box systems to have personality.

## Remaking of a Classic

It is clear that for the Classic to rise again, Apple would have to reinvent it. The Color Classic was an attempt at reinventing the Classic. It looked different from the Classic and had more functionality. Not everyone liked its looks, but it did have character. Unfortunately, it was too slow and too expensive. A pizza-box

*continues*



and upright stance of the Classic demonstrated courage, affability, and individuality—all aspects of the Macintosh design philosophy. Basically, the Classic looked like a higher life-form, like E.T.

The soul of the Mac lives on in its friendly operating system, but its favorite vessel has passed on. In most ways, Macs have improved. Apple still has the best industrial design in the business, but in becoming as practical and affordable as PCs, the Mac family has unfortunately started to look like PCs.



model such as the LC III costs just a bit more with a bigger screen and a lot more speed. But the Color Classic's biggest problem was that it had no clear mission, distinct from other Macintosh models. So how can Apple revitalize the Classic so that it resonates with the personality and tradition of the original design?

- A new Classic should be small, with a keyboard not much wider than the system. There's still a need for a small-footprint desktop computer.

- A new Classic should be fast. A small upright computer should feel swift and nimble, not ponderous. A speedy Classic could use the 68LC040 chip found in the Quadra 605.

- A new Classic should have the expandability of the Color Classic, which offered a pullout expansion drawer. Despite the engineering difficulty, Apple should add a CD-ROM drive, and create a great inexpensive player for titles.

- A new Classic should have a strong

visual identity. It should assert its individuality and stand upright instead of assuming the prone position of a PC. Apple should make it black and slick.

### A New Mission

But more important, give the next Classic a new mission. Its smaller size would make it ideal for personal communications. The next Classic could combine a desktop computer and communications center, saving desk space and money. An office phone has nearly two-thirds the footprint of the original Mac. The new Classic could have an option for a built-in phone. Perhaps a videoconferencing option would be appealing in a hybrid communications/computing system that combines voice mail, E-mail, and other communications. The new Classic would also be good for word processing, contact management, and other mainstay productivity tasks.

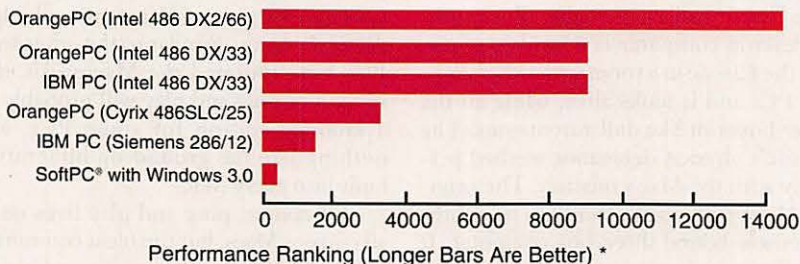
A version of the Classic could have an integrated docking station for a Newton, another PDA, or a palmtop. I think most people have a greater need for a fully integrated approach like this than for a stand-alone PDA. People should be able to take notes and manage their activities with maximum portability, and then seamlessly integrate data with the new Classic.

There you have it. Frankly, I'm not expecting Apple to make a new Classic. Fans of the original compact Mac design should probably form a club and find ways to breathe new life into our old machines. I've heard that it's technically possible to install a Performa 550 or LC 520 motherboard in a Color Classic if someone could write a simple enabler. And somewhere in my garage there's a can of spray paint labeled Batmobile Black.

It would be hard for Apple to make a successful new Classic. All the same cost issues apply that led to the Classic's demise in the first place. It would take a tremendous act of will on Apple's part to reinvent the Classic, and it would be a brave gamble. It couldn't be the least expensive Mac, and this runs against the lessons learned over the last few years.

Pragmatism is at least as important as innovation at today's Apple. But pragmatism alone won't ensure the long-term success of the Mac. The Power Macintosh promises to eventually provide an astonishing new interface with innovative applications. But we need a model that preserves the tradition of the Macintosh way. To maintain our strength and hope against the mindless robotic hordes of PCs and their championship of mediocrity, we need an emblem to rally around. We need a new Classic to remind us that the Mac has always been insanely great. **m**

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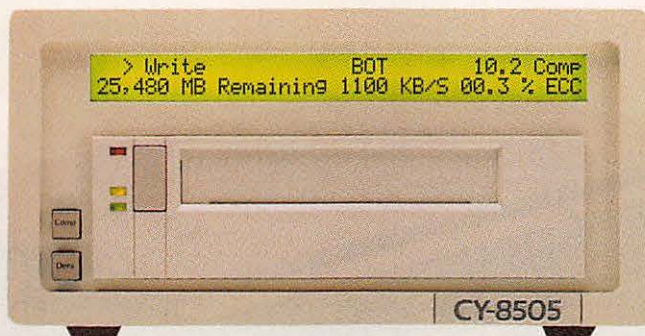
\* Benchmark results are based on the Processor Harmonic measurements from PC Bench version 7.01. SoftPC for Windows was run on a Quadra 700. © 1994 Orange Micro, Inc.

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Sean Safreed  
— MacUser

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# Letters

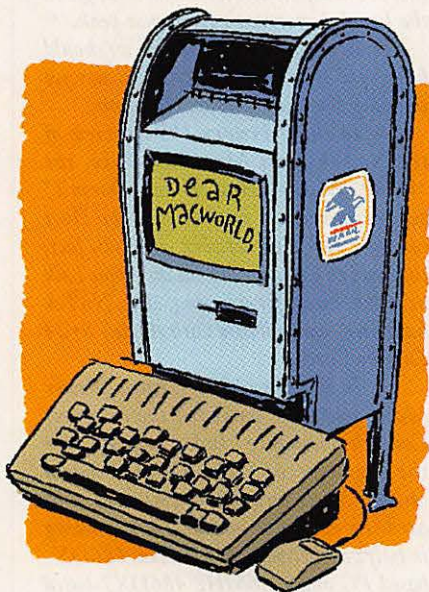
## Drawing the Wrong Conclusions

I'LL BET DEKE McCLELLAND'S REVIEW of Aldus FreeHand 4.0 (*Macworld*, March 1994) would not be as favorable if it were not for his extensive experience with Adobe Illustrator. Perhaps, compared with Illustrator, FreeHand 4.0 is a step in the right direction. But compared with FreeHand 3.1, it is a step backward. Being a longtime devotee of FreeHand (since 1988), I can assure you that version 4.0 does the same thing as your vacuum cleaner, and I don't mean that it cleans up.

With release of this upgrade, I fear that Aldus has lost the grip it once held in the drawing program market, *drawing* being the operative word here. Over half of Mr. McClelland's review of a drawing program was devoted to its text-handling features. What's wrong with this picture? We do not need slow and often impossible-to-edit tables in a drawing package, nor do we need a poorly designed text ruler. Leave the text to Aldus PageMaker—FreeHand is supposed to be an illustration tool.

FreeHand 4.0 is cluttered with palettes (Deke claims nine, but there are actually ten); even the old masters could handle only one palette at a time. In all, these palettes occupy nearly 35 square inches of screen real estate. What was the program-development team at Aldus thinking? What was wrong with the dialog boxes you brought into view with a keystroke, edited quickly, and closed by touching the enter key? They helped make the software work like a taboret, a common piece of art-studio furniture that holds graphics tools so that only the drawing occupies the drawing board. The artist pulls tools from the taboret without interrupting the work in progress.

The system requirements listed on the FreeHand 4.0 package should read "68040 (or plenty of free time), a minimum 20-inch monitor (to accommodate palette clutter), and a burning desire to



become a word processor instead of an illustrator." One more request: Aldus, if you're listening, please don't fix these problems by releasing another version and renaming it "Professional."

Bill Jennings  
Placentia, California

In truth, FreeHand 4.0 has 11 palettes—we found another after we read Mr. Jennings's letter. We hope the palettes aren't breeding.—Eds.

## Vendors Don't Deserve Sympathy

PLEASE—SPARE US THE MANUFACTURERS' bellyaching about the cost of tech support (*Conspicuous Consumer*, March 1994). Manufacturers' costs are nothing compared with what we users put up with from bug-ridden products and poor instructions. More than half of my tech-support calls are due to inadequate or downright wrong instructions, and 99 percent of the rest result from product bugs. Maybe some bugs are excusable, but poor instructions are not, especially when a company refuses to correct known errors printed in its manuals.

Consider the instruction/reference card for my Hewlett-Packard LaserJet IV printer. I could not solve a persistent (and expensive) stoppage problem by following the instructions. When I called HP tech support, I learned (after 20 minutes on long-distance hold) that the *instructions* were in error, and that HP had known about the errors for more than a year but didn't deem it enough of an issue to bother correcting it.

Joel Amkraut  
Los Angeles, California

According to Hewlett-Packard, the Quick Response Card that Mr. Amkraut refers to is intended to provide short-term help with common problems encountered by HP LaserJet users. The information on the card is incomplete, but the correct information can be found in the LaserJet owner's manual.—Ed.

## Freeware ≠ Public Domain

I'M A LONGTIME SUBSCRIBER TO *MACworld* and am tickled to death, in one sense, to see myself mentioned in Erfert Fenton's article on fonts in the March 1994 issue ("The Right Font"). But I'm also good 'n' mad, too, because she got much of it wrong.

On page 119 of the issue, my Logger font is featured in "Specialty and Miscellaneous Faces" as example 8, with the identification "Logger, a public-domain font by David Rakowski." I never released a font into the public domain; to do so would mean I relinquish any copyright. I released that font as freeware while retaining the copyright, which is vastly different from Ms. Fenton's characterization of Logger as in the "public domain."

The second, even more glaring, error regards Ms. Fenton's description of Lazy Dog Foundry's Cheese Dog and Running Dog collections, which she calls "the cream of the crop from shareware and public-domain font archives." Wrong again. All of the fonts in those collections *continues*



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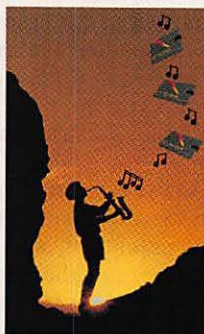
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Circle 73 on reader service card

## CORRECTIONS

■ In the April 1994 Desktop Critic, PCPC's number should have been 813/530-0123. The toll-free number is 800/622-2888.

■ Also in April, Diagsoft's toll-free number in the "Troubleshooting Tips and Tools" feature should have been listed as 800/342-4763.

■ In Step 6 of Expert Graphics (April 1994), the artist moved the Input (not the Output) Levels' white triangle to the Levels histogram's rightmost peak.

■ In April's "Corrections," we should have said that Blyth Software is not yet shipping the Unix version of Omnis.

■ In the February 1994 review of the NuTek Duet Mac work-alike, the "What Works—And What Doesn't" sidebar incorrectly implied that the Duet cannot work with network cards. In fact, the NuTek cannot work on an AppleTalk network, except for printing. Also, NuTek has tested compatibility with Apple's 8•24 Display Card.

■ In the May 1994 feature "Power Mac Software," we listed the incorrect Core-Performance Index rating for the prototype 66MHz 486DX2-based Orange Micro OrangePC 290 coprocessor card. Its rating should be 18.4, putting it halfway between a 33MHz 486DX-based PC and a 66MHz 486DX2-based PC compatible.

are licensed from me; none were ever released into the public domain, and none of the fonts in the collection that were originally released as shareware are sold in the same version—they have been cleaned up, international characters have been added, and hinting and kerning has been enhanced in every single font in those collections. Also, less than one-third of the fonts in the Running Dog and Cheese Dog collections were ever shareware fonts; the other two-thirds, for which Lazy Dog is the exclusive American proprietor, have been created since I stopped releasing shareware fonts.

David C. Rakowski  
via CompuServe

I stand corrected. The Read Me file that accompanies the Logger font includes a copyright notice, making it freeware. Also, I did not mean to imply that Lazy Dog Foundry was engaged in unethical practices by distributing shareware or public-domain fonts in its Cheese Dog and Running Dog packages. In my experience, Lazy Dog has always been a reputable outfit. I reviewed Lazy Dog's Type of the Twenties & Thirties series and listed the other collections as additional offerings from the company; I didn't real-

ize that the onetime-shareware fonts that made up a portion of the Cheese Dog and Running Dog collections had been enhanced since their initial release.—Erfert Fenton

## Booster Booster

BASED ON YOUR ARTICLE IN THE March 1994 issue ("CPU Boosters"), I mailed my IIsi to Mac Experts in Santa Monica, California, on a Thursday and got it back the next Tuesday. I asked the company to do the boost (\$89) and to fix the IIsi's sound problem (\$25). I sent the CPU via overnight mail for \$40 and paid another \$40 to have it returned overnight, for a total of \$194 portal-to-portal.

The clunky ol' IIsi that I love so much now has a new lease on life. It isn't an 840AV (my dream machine), but it did not cost me 4000 bucks, either. My new machine will last me another year or two until I mortgage the house for a PowerPC. Now if I can just figure out how to slam a cache card into that overcrowded little IIsi box.

Robn Butterfield  
via America Online

## Fab Four Make Fab Disc

IN HIS REVIEW OF THE TOP-TEN CD-ROMs in the March issue, James A. Martin lists the Beatles' film A Hard Day's Night (The Voyager Company) as one of the worst CD-ROMs that he tested.

The author admitted that A Hard Day's Night was "actually a decent product." The only flaw he could put forth was that the film "doesn't deserve such veneration" as would a movie such as *Casablanca*. In my opinion, *A Hard Day's Night* does deserve such veneration, since it is an important piece of the history of rock and roll. But my opinion of the importance of the film is beside the point, as is Mr. Martin's.

A Hard Day's Night is a great example of what CD-ROM technology can deliver when developers take the time to do it right. In addition to the 1964 full-length feature film, there is also the film's script (which plays along with the movie); the trailer from the 1982 rerelease; an interview with the film's director, Richard Lester; and another short film by Lester that served as inspiration for *A Hard Day's Night*.

It would have been a much greater service to readers if Mr. Martin had warned them about CD-ROM titles out there with serious flaws in design and execution, instead of reciting his opinions  
*continues*



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**Circle 18 on reader service card**

30 June 1994 **MACWORLD**

about which movies should or should not be captured on CD-ROM. My advice to Mr. Martin is that he leave the job of reviewing movies to Siskel and Ebert.

*Sam Choukri  
Columbia, Missouri*

A community college in North Carolina at one time offered an accredited course on "The Andy Griffith Show." While I'm sure it was an entertaining class, its subject struck me as not entirely worthy of academic scrutiny. And that's how I feel about *A Hard Day's Night*—it's great to have a movie to analyze on CD-ROM, and the Voyager product is nicely executed. But in my admittedly subjective opinion, there are hundreds of other films that would make for much more interesting examination, and that's why I included the disc among the "misguided and downright bad CD titles." —J.A.M.

## MacTools Needs Fixing

I COULDN'T DECIDE WHETHER TO laugh or cry when I read your four-star review of MacTools 3.0 in the March issue. I had ordered the upgrade, despite the excessive price for a current MacTools user, because I had been pleased with version 2.0; it had solved problems for me that Norton Utilities could identify but could not fix. I received the (supposedly) fixed 3.0a, but very little seemed to work well. In fact, I found the software to be so bad that I returned it for credit to the mail-order house from which I purchased it.

CP AntiVirus simply would not run at all; every time I tried to use it, it would quit with a type 1 error. TrashBack was confusing to implement, and the TrashBack folders somehow became visible on the desktop—much to the consternation of my spouse, who wondered what I was up to *this* time. AutoCheck caused a major degradation in performance even when it was supposed to be "sleeping" and had been set to run only once per day. And finally, CP DiskFix continually found problems in the desktop database that it could not fix and that Norton Utilities 2.0 and Disk First Aid 7.2 didn't even find. I am using a very typical IIfx (32-bit clean, math chip installed, and so on) with System 7.1, and I experienced these problems even when starting up with all extensions and INITs turned off.

I will continue to use MacTools 2.0, since I have it, but I would not recommend version 3.0 to anyone until it undergoes a major overhaul.

*Steve Parker  
via America Online*

After I had finished the MacTools 3.0 review, I began to see a number of problem reports posted in Cen-

tral Point's online support forums. I've been unable to reproduce those problems on my Macs, including those problems mentioned in your letter. Central Point Software has since released maintenance upgrades for several components of the MacTools 3.0 package. You can download updates from Central Point's forums on America Online or CompuServe, or you can get a disk with the updates from the company for a nominal fee.—Tom Negrino

## Unicorn Fixes MIDI

IN THE MARCH 1994 *POWERBOOK NOTES*, Cary Lu mentions problems with MIDI on 100-series PowerBooks and implies that Opcode Systems' OMS is the only solution. Mark of the Unicorn has a control panel called Unicorn Power that fixes both PowerBook serial ports (OMS fixes only the printer port) for our MIDI software. This fix is included with our latest versions and is free to registered users of our software.

*Neal Lischner  
Mark of the Unicorn  
Cambridge, Massachusetts*

## Loyal Customer or Captive Audience?

I AM GETTING UPSET ABOUT THE constant upgrade notices I receive. In less than two years, I have spent \$90 on upgrades for Aldus's SuperPaint, even though the program now sells new through mail order for \$99. Would you believe \$400 in 2½ years for Aldus Free-Hand upgrades? And Aldus PageMaker is not far behind.

I understand the expense involved in programming and R&D. But why should those who purchased the programs and support the company be hit so hard for upgrades? I use all of the above programs and have upgraded every time I received a notice. Software companies should throw away the stamp that says "Sucker" and use one that reads "Loyal Customer: To Be Treated Fairly."

*Alan Ratzburg  
San Jose, California*

Letters should be sent to *Letters, Macworld*, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically, to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1), or via Internet (70370.702@compuserve.com). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. **m**





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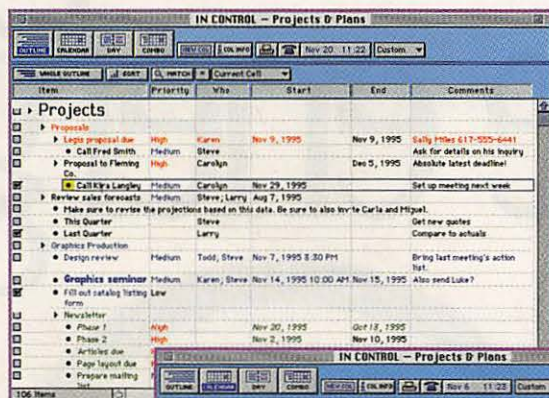
# SEVEN GREAT WAYS TO GET TOTALLY IN CONTROL™

**1. Spend your time wisely.** IN CONTROL is easy to use, so you can dig right in and start planning immediately. And with its fully integrated outline and multiple-view calendars, you can plan, organize and schedule — all at the same time!

Plus, IN CONTROL's handy Lookup feature gives you speedy access to FileMaker® Pro, Touchbase™ Pro, Now Contact™ and Dynodex™. IN CONTROL even dials the phone!

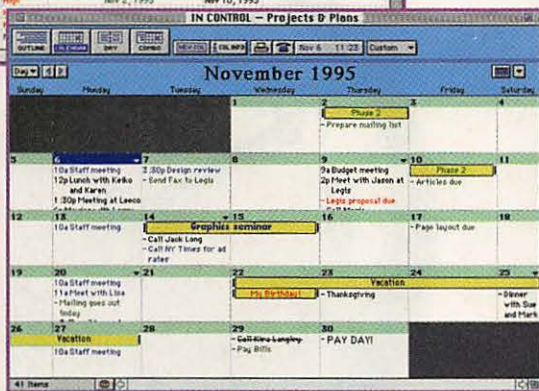
**2. Plan smarter and better than ever before.** IN CONTROL helps you prioritize everything — in as much detail as you need — so it's easy to choose what's most important to work on first.

**3. Be adaptable to change.** IN CONTROL's flexible, intuitive interface makes changing your plans, reorganizing your day, shifting responsibilities and rescheduling your appointments a snap.



IN CONTROL'S  
multi-column  
Action Outliner™  
helps you  
plan smarter.

Flexible calendar  
features make  
viewing easy...  
and scheduling  
a breeze.



**4. Keep your sense of style.** Unlike many "get organized" products, IN CONTROL doesn't force you to change your style. It works the way you work, and provides countless tools to help you get organized faster, better and easier than ever before. You can even print pages to fit the most popular paper organizers.

**5. Don't lose sight of the big picture — or the details.** IN CONTROL's daily, weekly and monthly calendars allow you to view your activities up to a year at a time, ensuring that all your plans fit with your long-term goals.

With IN CONTROL's new daily views, you can also focus on the details — like your schedule or to-do's for one particular day.

**6. Never let anything slip through the cracks again.** IN CONTROL can automatically remind you of your most critical tasks, guaranteeing that you won't forget anything. Plus, Auto carry-forward and recurring event features speed up scheduling.

**7. Get the all-new IN CONTROL 3.0 risk-free.** When you order, you don't risk a penny because IN CONTROL is backed by our ironclad 60-day guarantee of total satisfaction.

**60-DAY UNCONDITIONAL MONEY-BACK  
GUARANTEE.** Through participating dealers.

For more information, or site license or volume discounts,  
call: 1-800-925-5615 or 617-776-1110.

To upgrade, call: 1-800-784-7388 ext. 300.

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MacUser  
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MACWORLD  
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\$85  
Suggested retail: \$129.95  
BUS0411 IN CONTROL 3.0

Circle 6 on reader service card

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*This is Bob, the new employee. Whether Bob works at home or is part of your office network, PowerTalk software makes it easy for him to collaborate with colleagues—without wasting his energy on lots of complex procedures or training. Plus, PowerShare makes network expansion easy for you. So easy, you can add 200 or 2000 more Bobs by simply adding more PowerShare Collaboration Servers.*

**PURCHASE ORDER**  
90972

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EQUIPMENT PURCHASE FOR PROTOTYPE	RE NO.	3990786

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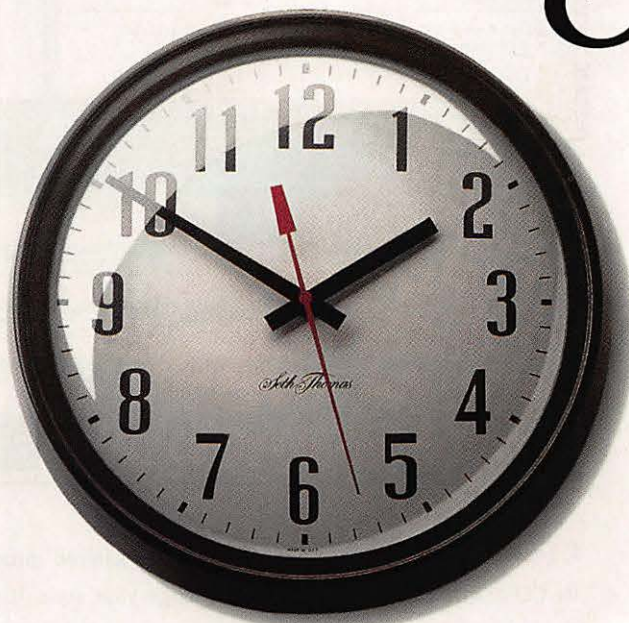
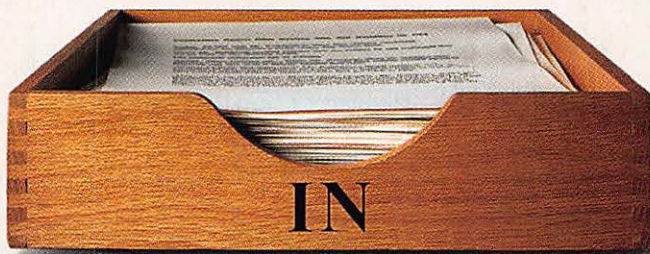
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Job No:	XL9485	Date:	1/31	Time:	4:32
Title:	PROTOTYPE DEVELOPMENT	Engineering:	MLK	Project Manager:	AP
Accounting:	AP	Production:	AP	Marketing:	AP
Revision:					

*It takes a lot of effort to physically route paper documents between different departments. With PowerTalk and Digisign<sup>®</sup> software, however, people can now approve things electronically—saving time and money (and, of course, trees).*

# Announcing conserve energy

*PowerTalk, when used with any personal gateway<sup>®</sup>, combines your voice mail, e-mail and faxes into a single universal mailbox. So you can check all your messages in one place (instead of going to the trouble of checking them separately, like you're used to doing).*



*You can spend your time and energy learning five different communications programs. Or, you can use PowerTalk, which lets you send faxes, e-mail or any other kind of message, all with one simple procedure—right from the program you're already working in.*





*With PowerTalk, sending a simple business letter is the last thing you'd expect: simple. Instead of fiddling with passwords and enclosures, just drag your letter icon onto the recipient's business card icon. PowerTalk does the rest.*

*It's easier than ever to stay in touch when you're on the road. Just choose who you want to send your document to, and PowerTalk takes care of passwords, phone numbers and how it gets there (fax, e-mail, etc.). So you don't have to waste your energy doing so.*



In a world of immovable deadlines and shrinking bottom lines, you've got better ways to spend your energy than fiddling with passwords, enclosures and multiple interfaces. Recognizing this, the engineers at Apple created two of the most helpful networking innovations in the history of personal computing: PowerTalk™ and PowerShare™ Collaboration Servers software. With these improvements, your Macintosh® now automatically does many of the tasks you used to do manually—so you can focus on working with your colleagues, instead of focusing on getting your computers to connect. PowerTalk is the first piece of software



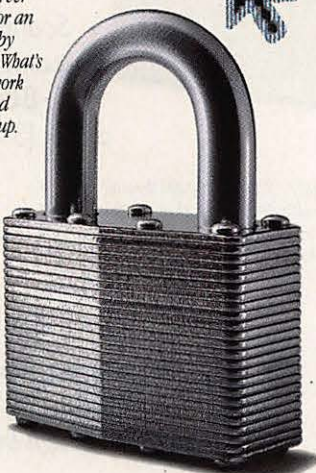
*PowerTalk comes standard with System 7 Pro. PowerShare Collaboration Servers software is available separately.*

# a new way to y in your office.



*You install PowerShare server software on a Macintosh or an Apple® Workgroup Server by simply pressing a button. What's more, a PowerShare network is as easy to expand—and maintain—as it is to set up.*

*The bigger the network, the greater the need for security. That's why, to ensure total confidentiality, PowerTalk and PowerShare automatically encrypt all messages sent over your network—eliminating extra work and extra worry for everyone.*



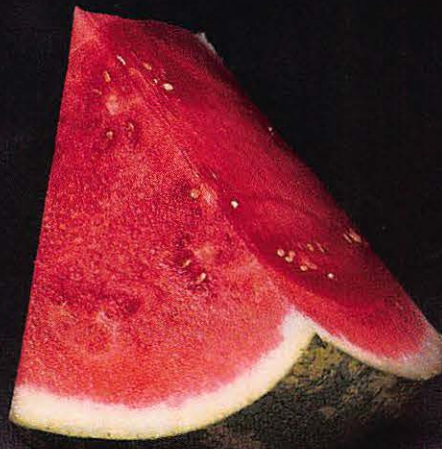
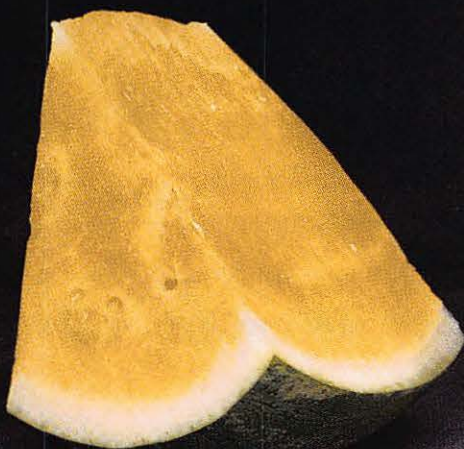
designed to make collaboration easier for individual users. Instead of bothering with separate voice mails, faxes and e-mails, all communications now reside in a single mailbox. And all messages are sent and received with the mere click of a mouse—no separate programs, no separate passwords. Plus, a catalog feature even lets people keep detailed information on their colleagues: numbers, addresses and instructions on how to send them information. PowerShare makes setting up a network equally simple. The software is easy to install and easy to maintain. Keeping track of people is easy, and adding new people is easy. To see how PowerTalk and PowerShare can help your company, call 800-732-3131, ext. 200, for the name of the authorized dealer nearest you. And discover the power that takes the work out of working together. The power of Macintosh. The power to be your best.\*



**Introducing PowerTalk and PowerShare from Apple**



# We Scan Corrected.



You expect a scanned image to accurately reflect the color found in your original. Getting there, however, is usually no picnic. After scanning, precious hours are often spent adjusting the image in software to capture the truest blue, a faithful fuchsia, or for example, just the right kind of red in a ripe watermelon. But DCR™ has changed all that.

Now, when you purchase the **new, low-priced ScanMaker® IISp single-pass color scanner**, you also get **DCR, Dynamic Color Rendition**, an advanced, yet easy-to-use color calibration and correction system.

DCR actually calibrates the ScanMaker IISp to a photographic industry-accepted calibration target, creating a custom color profile of your

specific scanner, ensuring the most accurate color possible as you scan the image. But don't take our word for it. Here's what *PC Magazine* said in their February 8, 1994 issue: "...this mechanism (DCR) seems to have worked well, because the ScanMaker IISp's color output was clearly the best of any scanner in our survey."

So, even if you need to capture the bright yellow flesh of a Honeyheart watermelon, like the wedge on the left, the quickest way to do it is with the new ScanMaker IISp with DCR.



For more information about the ScanMaker IISp, DCR, your nearest authorized Microtek reseller, or a **FREE** copy of *The Scanned Image* — a scanning primer, call **1-800-654-4160** or fax (310) 297-5050.

*The ScanMaker IISp accurately captures millions of brilliant colors at resolutions up to 1200 x 1200 dpi through software interpolation (300 x 600 dpi optically). In addition to the DCR color calibration/correction system, the ScanMaker IISp is bundled with Adobe Photoshop 2.5 LE for either Windows or Macintosh. Windows users also get Caere's PageKeeper Portfolio document and image management software.*



Get a hands-on demonstration of the ScanMaker IISp with DCR and find out more about accurate color scanning by attending Focus Seminars' "ColorRight, Color Correction & Reproduction Workshop." For dates and locations, call Microtek at 1-800-654-4160.

**MICROTEK**  
Better Images Through Innovation.

The DCR color calibration / correction system is a proprietary system of Microtek Lab, Inc.. The following are trademarks or registered trademarks of their respective companies: Microtek, ScanMaker and DCR (Dynamic Color Rendition) of Microtek Lab, Inc. Adobe Photoshop LE of Adobe Systems, Inc. PageKeeper Portfolio of Caere Corporation. SMIISP294

Circle 287 on reader service card



# MacBulletin

**LC 575 Reborn as Performa** As expected, Apple is bringing out Performa models of its 33MHz, 68040-based LC 575 (see "Apple Ships First All-in-One 040 LC," *Macworld News*, April 1994). The new all-in-ones are the Performa 575, which has a 250MB hard drive and 5MB of RAM; the 577, which has a 320MB hard drive and 5MB of RAM; and the 578, which has a 320MB hard drive and 8MB of RAM. All have an internal tray-loading double-speed CD-ROM drive and bundled software including ClarisWorks 2.0, Quicken 4.0, Macintosh PC Exchange, Best of Homeworks Templates, ClickArt Performa Collection, America Online, At Ease, American Heritage Dictionary, Mario Teaches Typing, Spectre Challenger, and SuperMunchers. Bundled CD-ROM titles include Grolier's Encyclopedia, 1993 Time Magazine Almanac, Dinosaurs, and Wacky Jack's CD Game Show. The new Performas should ship to mass-market channels by early May. Prices will vary by reseller.

**Novell Acquires WordPerfect** Possibly creating a software behemoth to rival Microsoft, Novell is acquiring WordPerfect Corporation (a move that requires government approval) and has bought the Quattro Pro spreadsheet from Borland International. Novell gained the right to distribute 1 million copies of Borland's Paradox database. This should heat up the software-suite battle, where Microsoft currently leads.

**Some Slowdowns on Power Macs** Reports are circulating that the Power Macs' SCSI and NuBus have flaws that make these Macs transfer data more slowly than Quadras. However, Macworld Lab's investigation shows that the slowdown occurs only for very fast systems, such as some disk arrays and video cards, and in most cases is caused by the lack of an updated driver from the array or card vendor. Vendors we contacted planned to have updates shortly.

**100MHz PowerPC** Upping the ante in the processor wars, IBM and Motorola plan to begin shipping a 100MHz version of the PowerPC 601 chip in large numbers in the fourth quarter. The chip is up to 25 percent faster than the speediest existing version (80MHz) and uses only 4w of power; the original 601 uses 8w. Motorola also cut prices on its PowerPC 601 chips.

**Quark Extends PowerPC Upgrade** Quark has changed its PowerPC upgrade plan, which had drawn criticism from users. Previously, users had until July 1 to buy the PowerPC upgrade (due in early summer) of QuarkXPress 3.3 for \$199; after that, the price would be \$999. Now, Quark will offer the \$199 price until October 1, raise the price to \$229 until December 31, and go to \$999 after that.

**America Online Adds Capacity** After being swamped by new subscriptions, America Online said it has increased its computer capacity by about 50 percent. Many subscribers had reported being unable to get through. The company also now offers 9600-bps access from Macs. 800/827-6364.

**Applied Engineering Collapses** Applied Engineering—vendor of upgrade boards and accessories—has gone out of business. Separately, Interex Computer Products said it had bought Applied Engineering's remaining battery chargers for PowerBooks and will resell those and then make them under its own name. Interex, 316/524-4636.

**Golden Triangle Folds** Disk-drive-utility vendor Golden Triangle is reorganizing and has already laid off most of its employees, making tech support "extremely difficult if not impossible," according to the company. A Golden Triangle executive said the company has not charged any customer credit cards since January. 619/587-0110. **m**



# News

EDITED BY TOM MORAN

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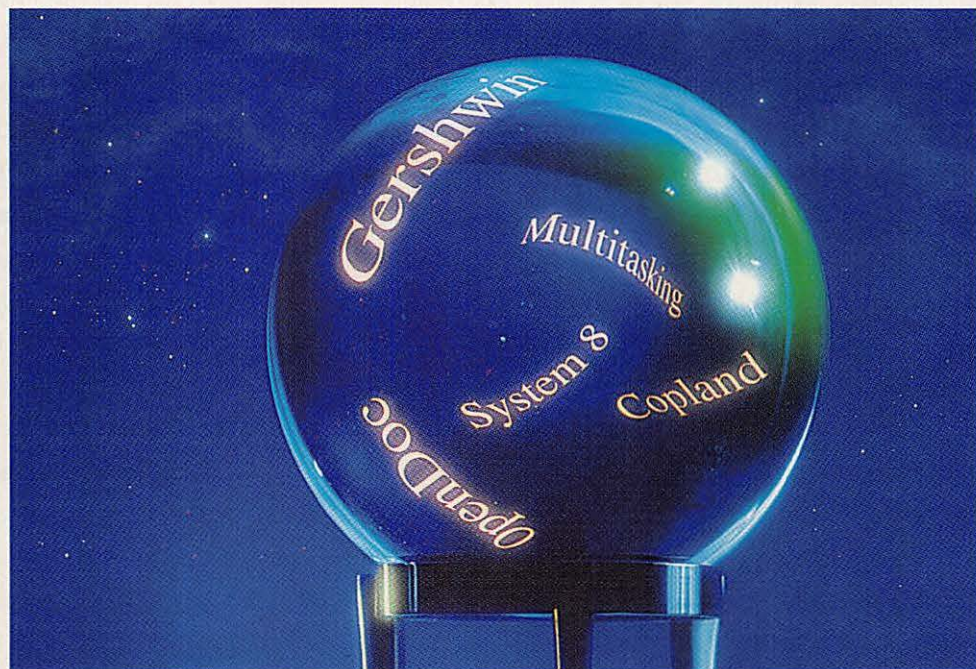
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## Apple Tells Its Software Future

Saying it intends to increase the Macintosh's market share, Apple recently detailed its upcoming system software offerings and outlined the future of Macintosh Operating Systems. The company said it plans to move from today's passive user interface to active assistance for greater productivity, from networks to collaboration for effective teamwork, from today's monolithic applications to component-based software (OpenDoc) for faster custom solutions, and of course, from CISC (680X0) to RISC (PowerPC) for improved price/performance.

Beyond the latest System version, 7.1.5, Apple expects to introduce the following:

- System 7.5, which should appear this summer in versions for 680X0-based Macs and Power Macs. System 7.5 will add Apple Guide (the first instance of active assistance), a scriptable Finder, drag-and-drop for fast printing and other automatic processing of files, the famously overdue QuickDraw GX, multithreading (a first step toward multitasking), PowerTalk collaborative communications software, Mac-



WILL CROCKER

TCP, file-synchronization management, and software for easier translation of DOS and Windows files.

- OpenDoc, once code-named Amber (see "Amber: beyond Applications," *News*, September 1993), started at Apple but later moved to Component Integration Laboratory (CILab), the consortium charged with making

OpenDoc a standard across multiple hardware platforms. With OpenDoc, users will never have to leave the compound document they're working on. If a user decides to add a chart, OpenDoc will access a charting component. The obvious advantage is not having to open and close a lot of huge applications to make changes. The less-obvious

advantage is that users can choose among competing charting components, for example, as well as mix components from different vendors in a way that's not possible now. OpenDoc may also encourage creative software, since a small developer could sell a clever component without building a huge monolithic application around it.



Current members of the CILab consortium include Apple, IBM, WordPerfect, Novell, Oracle, Sun, Xerox, and Taligent. CILab is encouraging Microsoft to participate in OpenDoc, and Microsoft and Apple recently agreed to divvy up the tasks involved in building bridges between OpenDoc and OLE, Microsoft's equivalent of OpenDoc. OpenDoc software developers' kits (SDKs) are due this fall. Applications should take at least six months to show up after SDKs are available for a given environment.

- Copland, also known as "System 8," is expected in 1995. Copland will add improved active assistance; cooperative multitasking; memory protection to reduce conflicts from multitasking; and "a new I/O architecture," probably incorporating the newish PCI bus and/or FireWire, the high-speed serial bus that may replace SCSI, existing serial ports, and the Apple Desktop Bus (ADB).

- Gershwin is expected in 1996. The Gershwin operating system will mark the appearance—finally—of true preemptive multitasking on the Mac, but software developers will have to rewrite their applications to take advantage of that capability. Gershwin will also provide intelligent assistance, which observes what you do and makes suggestions, and advanced graphics with cut, copy, and paste. Apple is designing Gershwin to have a microkernel architecture, which means it will have core code designed for easy portability to various hardware platforms. Apple's microkernel will probably not be identical to IBM's proposed standard WARP microkernel, because WARP is too big to fit on an affordable entry-level system, according to an Apple representative. However, the Apple microkernel may be a subset of the WARP kernel, so that applications written for Gershwin would still run if Apple later decided to move to the full version of WARP.

- The object-oriented, platform-independent Taligent operating system from the joint venture of Apple, IBM, and Hewlett-Packard will be interoperable with OpenDoc but is probably still several years away.

- David Nagel, senior vice president and general manager of Apple's AppleSoft division, suggested that the high performance of PowerPC chips would make qualitative changes possible in the user interface, possibly including speech input and output or multiple 3-D graphics environments that would replace or supplement today's desktop metaphor.—T.M.

## Adobe, Aldus to Merge

NEW PUBLISHING TITAN

**A**dobe Systems and Aldus Corporation—two leading makers of desktop publishing software—announced a definitive agreement to merge, subject to approval by shareholders in July and by the Federal Trade Commission.

The new company—still unnamed at press time—will become the fifth-largest software vendor, with \$500 million in annual sales. Adobe chairman and CEO John Warnock and president Chuck Geschke will keep their positions, and Aldus chairman and president Paul Brainerd will serve on the board.

Both companies "plan to continue all of our products currently in the marketplace for the foreseeable future," said Brainerd, noting the overlap between Aldus FreeHand and Adobe Illustrator. However, outside sources speculate that the rights to FreeHand could revert to Altsys, FreeHand's developer. (For a comparison of these draw programs,

see "FreeHand vs. Illustrator," in this issue.)

Jim von Ehr, president and CEO of Altsys, said a merger would not invalidate Aldus's rights to FreeHand, but that Altsys would not "sit back and let FreeHand become the number two product." Companies have shown an interest in acquiring FreeHand from Altsys over the years, he noted, saying only that "all possibilities are open to us now."—JAMES A. MARTIN

## Apple 17-inch Display

MULTIPLE-SCANNING COLOR MONITOR

**S**ince the days of the 9-inch display, the world has shrunk and monitors have grown. The midrange of Apple's monitor lineup is now the Multiple Scan 17 Display, the company's second multi-resolution color monitor. Based on a 0.26mm stripe-pitch Trinitron tube, the Multiple Scan 17 can handle multiple resolutions from 640 by 480 pixels (standard 13-inch size) up to 1024 by 768 pixels at 75Hz. The monitor can also display a range of resolutions at 60Hz, including VGA and SVGA, and it ships with an adapter that connects it to PC-compatible systems.

Users can adjust everything from brightness and contrast to convergence and

*continues*



The Apple Multiple Scan 17 Display offers a wide range of resolutions, including VGA and SVGA.

## Apple's Cheaper CD-ROM Drive

Apple has unveiled the AppleCD 300e Plus external CD-ROM drive and the 300i Plus internal CD-ROM drive, which the company says are as fast as the current 300e and 300i models and offer a motorized loading tray and a lower direct price. The price of the 300e Plus was expected to be about \$349, while the 300i Plus was expected to be around \$319. They replace the existing models. 408/996-1010.

## Apple Speakers: The Sequel

Apple's new AppleDesign Powered Speakers II are about a third smaller than the company's existing speakers. Available now for \$79 in black, the speakers also come in platinum with Apple's new Apple Multimedia Kit for Macintosh. When it ships in May, the \$449 kit will include an AppleCD 300e Plus CD-ROM drive (see above), headphones, Compton's Interactive Encyclopedia, and a choice of three software titles.

## DGR Cuts Optical Price

DGR Technologies has dropped the price of its 256REM 256MB removable optical drive to \$1099. The drive ships with one 256MB cartridge, all cables, and CharisMac driver software. 512/476-9855, 800/235-9748.

## 24-Hour Tech Support

Digital Equipment Corporation's \$149 Service-in-a-Box provides toll-free, 24-hour unlimited technical support for a year on more than 450 Mac and PC applications including ACI US's 4th Dimension, Adobe Illustrator and Photoshop, Aldus PageMaker and FreeHand, Claris FileMaker Pro, Lotus Notes, QuarkXPress, and just about any Microsoft app. Service-in-a-Box is itself intended as a first line of defense, but live operators are standing by at all times. 603/884-4304, 800/722-9332.



pincushion with digital controls, and the monitor remembers the settings for different resolutions and reverts to them when you select that resolution. A total of ten different resolutions are available: eight factory preset and two user-definable. Apple also includes the new Display Manager and Monitors control panel with the Multiple Scan 17, so that users can make such resolution switches without restarting the Macintosh. With the new software, users will also be able to switch between active monitors and shuffle the virtual-desktop layout without restarting. These capabilities depend to a certain degree on the available video-display hardware and may not work on older Macs. Display-card manufacturers may also have to update their boards. Finally, users concerned about color precision may choose from three white points (5500K, 6500K, 9300K), and the display's ColorSync profile is included.

The Multiple Scan 17 has the same tilt-and-swivel base as the 16-inch Apple monitor it replaces; users will find ADB jacks in the back and headphone and microphone jacks located in the front for easy access. The Multiple Scan 17 Display also complies with the MPR II and Energy Star guidelines. At a direct price of \$1069, this monitor is right in

the thick of the 17-inch multiresolution color market. Apple Computer, 408/996-1010, 800/776-2333.

—CAMERON CROTTY

## Adobe Premiere 4.0

SUPPORTS ROLLING EDITS

**A** new window here, a new filter there, and a raft of small improvements all add up to Adobe's 4.0 release of its Premiere digital-video-editing software.

Accurately controlling the timing of a transition between two clips used to be a time-eating chore, but a new Trim window makes for easier and



Premiere 4.0 adds a Trim window for rolling edits, and supports filters that vary with time.

more-precise rolling edits. Premiere displays the video clips side by side, and you can opt to see just the current frame or to simultaneously look forward or backward in

## Big-Screen Multimedia Monitor

NEC Technologies introduced the MultiSync 4PG, a 27-inch monitor designed for multimedia and presentations. The display accepts input from Macs, PCs, VCRs, and video cameras, in VGA, XGA2, NTSC, M-NTSC, PAL, and S-Video formats. The monitor uses a flat-square CRT tube with several resolutions, ranging from 320 by 200 pixels to 1024 by 768 pixels (at 60Hz). The Energy Star-compliant monitor comes with a remote control and is available now. NEC estimates that the monitor's street price will be around \$3695. 708/860-9500, 800/632-4636.—T.M.



each clip by one or five frames, for instance while you adjust the transition point.

Previews from the Construction window now appear almost instantly; clips with as-yet-unrendered effects appear with hash marks through them, but you can get a quick idea of what your work will look like without taking a forced coffee break while Premiere assembles a preview.

Premiere 4.0 users can look forward to filters that vary over time, as well as the availability of filters from Photoshop 2.5. And whether you're previewing a project, a clip, an effect, or a trim edit, you can opt to send the output to the Preview window, which could, for instance, be moved to an NTSC monitor to more closely simulate final output. The Preview window is one of several windows that can be designated as floating, meaning that they remain in the foreground even when you click in another window.

Premiere 4.0 also features a laundry list of minor revisions, including a pop-up tool palette that's available from the Construction window, autosave, batch processing, the capability to work at true 29.97 frames per second, and improved handling of audio edit decision lists. The software should be available now on CD-ROM disc only in fat-binary format (a combined

680X0 and Power Mac version) from Adobe for \$795. Owners of Premiere 3.0 will be able to upgrade their software for \$129. Adobe Systems, 415/961-4400, 800/833-6687.

—CAMERON CROTTY

## QuickTime Ready for Prime Time

OFFERS PRO VIDEO  
FEATURES

**A**pple plans a midyear update to its QuickTime multimedia extension that will offer improved performance for all Macs, new features for video developers, and support for interactive television.

QuickTime 2.0 will let Macs play movies twice as fast as the current version, 1.6.1, according to Apple, with a data-throughput rate that will be increased from 1 MBps to 3 MBps. With 2.0, an 030-based LC 475 should be able to play back a 320-by-240-pixel movie at 30 frames per second, or a 640-by-480-pixel movie at 15 fps. Apple will also add a MIDI-like Music Track along with built-in support for 60-field video and time-code.

QuickTime 2.0 will allow editable, searchable, MPEG-

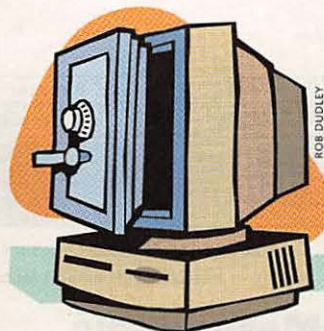
## THE AMCoEX INDEX OF USED MAC PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	\$800	+\$50
PowerBook 140/4MB/40MB	\$1050	+\$50
PowerBook 180/4MB/80MB	\$1700	\$0
PowerBook Duo 230/4MB/80MB	\$1200	+\$50
Mac Classic/2MB/40MB	\$425	+\$25
Mac SE/30/2MB/40MB	\$575	-\$25
Mac LC II/4MB/40MB	\$525	+\$25
Mac IIxi/3MB/40MB	\$625	+\$25
Mac IIci/4MB/80MB	\$875	-\$50
Mac IIfx/4MB/80MB	\$1050	-\$50
Centris 650/8MB/230MB	\$1300	-\$50
Quadra 900/8MB/160MB	\$2400	-\$50

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of March 21. Configurations include keyboard and exclude monitor and display board for noncompact models.



compressed video, and will support network distribution of movies. Apple hopes this capability will popularize full-length movies on CD-ROM discs, video servers, and the information superhighway. Apple Computer, 408/996-1010.—JIM FEELEY



## Claris Weaves Safety Net

UTILITY SOFTWARE  
SERVES AND PROTECTS

**D**esigned as a safety net for unsophisticated users, Claris's Safety Suite consists of 13 utilities that can preserve and recover data, guard against unauthorized access to files, and provide hard-to-remove identification for lost or stolen Macs.

Security-conscious users can password-protect their

hard disk drive, encrypt selected files and folders, completely erase or "shred" files so they are completely unrecoverable instead of just throwing them in the Trash, and monitor and log network access to their Macintosh. While your Mac is on but you're not there, a screen locker prevents busy hands from peeking at your data and provides a way for honest, upstanding visitors to leave messages for you. As part of the screen locker, a customizable message appears at the bottom of the display, identifying your machine in case of loss or theft.

Safety Suite can also pro-

tect your data from computer gremlins, automatically saving your files at intervals you specify and backing up your data when your Mac is idle (both features can be set to retain multiple versions of your documents). An undelete utility recovers those accidentally trashed files, and a Crash Protection feature records your keystrokes for last-ditch data rescue. The What Happened



Safety Suite includes 13 safety and security utilities for the Macintosh.

utility maintains an audit trail of machine activity to help you figure out what caused the joint-cracking system lockup you just experienced. Safety Suite is currently available for \$99 from Claris Clear Choice; 408/987-7000, 800/325-2747.

—CAMERON CROTTY

## BUGS & TURKEYS



Aldus has posted online FreeHand 4.0a, a patch to 4.0 that fixes several problems users encountered with printing, conversions, and font handling.



Microsoft is working on an upgrade to FoxPro that will address problems users have had with out-of-memory errors and printing to QuickDraw printers. The upgrade will be FoxPro 2.5c, and Microsoft expected to release it by the end of April. Microsoft says a free maintenance fix should be available by the time you read this.



Apple's \$10,749 Professional Video Production Solution, a bundle of video-editing hardware and software introduced in January, requires a PDS slot for its storage array controller board. But Power Macs don't have PDS slots. And Apple's PowerPC processor upgrade board for existing Quadras needs their only PDS slot. How will power-hungry video professionals move to PowerPC? Apple is aware of the dilemma.



When America Online users try to create private discussion rooms with titles containing the character sequence *s, e, x* (including, for example, *Safe Sex* and *Essex*), they can't; instead they get a message that vulgar room names can result in account cancellation. Responsible citizens and Anglophiles are out of luck.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

## Video Director

ASSEMBLE AND  
EDIT VIDEO CLIPS

**M**anually assembling an edited tape from source clips is a big pain, so Video Director for Macintosh 1.5 uses a special cable that plugs into your Mac's serial port to pipe commands to a camcorder (either LANC- or VISCA-compatible) and an infrared-controllable VCR. The VCR and the camcorder are directly connected with audio/video patch cords, and the camcorder acts as a source deck, while the VCR acts as a record deck. You control the source deck via a window that displays VCR-style controls. When you find a segment of video that you like, you mark its start and end points, and then Video Director remembers where it is and what tape it's on. When you've identified

*continues*

## In Brief

### Bigger SyQuest

The latest in 5¼-inch removable-cartridge drives from SyQuest is the SQ5200C, which uses the company's 200MB cartridges. The device can also read from and write to existing 44MB and 88MB SyQuest cartridges. Now available to peripheral vendors who will begin reselling it soon, the drive should start at a street price of around \$599, including one cartridge, according to SyQuest. 510/226-4000, 800/245-2278.

### Cheaper Bernoullis

Iomega has lowered the suggested retail prices of its Bernoulli 90 removable storage drives and 90MB cartridges. The Iomega MacTransportable 90 Pro now lists for \$419 (down 29 percent), and the MacTransportable 150 now lists for \$589 (down 16 percent). Single 90MB removable cartridges are now available for \$112, Tripacks for \$323, and MultiDisk 150 Tripacks for \$336. 801/778-1000, 800/456-5522.

### 500MB PowerBook Drive

Microtech International is shipping two high-capacity internal hard drives for PowerBooks and Duos. The RoadRunner 250i and RoadRunner 500i store 250MB and 500MB, respectively. The 250i lists for \$389, and the 500i goes for \$749. 203/468-6223, 800/626-4276.

### Image Analyst

MathWorks' MATLAB computation, data-analysis, and modeling environment now has a tool for analyzing, filtering, and enhancing images and other two-dimensional signals—MATLAB Image Processing Toolbox. The \$895 toolbox includes more than 100 functions for linear and non-linear filter design; filtering and image restoration; image enhancement; image analysis and statistics; 2-D transforms; and color, geometric, and morphological filtering. 508/653-1415.



fied all the clips you want on your final tape and arranged them on the event list, you click on Make Tape, and Video Director assembles your final tape, prompting you for different source tapes as necessary.

You can save event lists, and logging a clip automatically adds it to your clip library, from which you can recall it at any time. Video Director 1.5 for Macintosh is available for \$199.95 from Gold Disk; 408/982-0200, 800/465-3375.

—CAMERON CROTTY

## Pinnacle's Optical Array

STORES UP TO 5.2GB

The Orray from Pinnacle Micro is an optical array that works more like a fast hard drive than a collection of optical drives. The Orray comes in models that have two or four drives: each high-speed erasable optical cartridge functions like a platter in a hard drive. Data is multiplexed through custom ASIC

chips to each disk surface by a RISC processor-based master controller. According to Pinnacle Micro, the data is simultaneously read from or written to all the surfaces by using a large data cache. The company said it has applied for a patent on the multiplexing technology. A different mode accepts any 5.25-inch standard optical media cartridge up to 1.3GB. Estimated prices for the Orray optical drive array without media are \$7995 for two drives, and \$14,000 for four drives. The company recommends using an uninterruptible power supply. Pinnacle Micro, 714/727-3300, 800/553-7070.

—TIM WARNER



The Orray optical array from Pinnacle can store up to 5.2GB when configured with four 1.3GB erasable optical drives.



Macromedia's Director 4.0 features improved security and a revised interface with support for up to 32,000 cast members.

## Macromedia Director 4.0

IMPROVED  
AUTHORING TOOLS

Macromedia has announced Director 4.0, the first upgrade to the company's popular multimedia authoring product since 1992. Expected to become available at the end of March, Director 4.0 now offers improvements in memory management, a revised user interface, added support for up to 32,000 cast members and up to 48 channels, and increased security features. The company has revised Director 4.0 so that

users cannot use ResEdit to break into the player files as had been possible in previous versions of the software. The authoring program's file-size limit (previously 16MB) has been eliminated, and Lingo, the built-in Macromedia scripting language, also now includes object-oriented commands and expanded mathematical functions.

Director 4.0 has a suggested list price of \$1195, and current registered users can upgrade to the new version for \$199 until August 31.

Macromedia expects to ship the first-ever Windows version of Director sometime late this summer, and existing and future Director files will be compatible across both platforms. The company expects to introduce support for PowerPC Macintoshes in a future revision. Macromedia, 415/252-2000, 800/945-4061.

—JOANNA PEARLSTEIN

### TREND

## Fast 486 PC in Your Mac

ORANGE MICRO CARD FOR 680X0, POWERPC MACS

Orange Micro has revamped its OrangePC line of PC coprocessor cards to include Intel's 66MHz 80486DX2 CPU, as well as its 33MHz 486DX and 33MHz 486SX CPUs. The CPU chips are user-upgradable, including to the new Intel DX4 CPUs, which run as fast as 100MHz. The cards work in any Mac that accepts 12-inch NuBus cards; this includes the Mac II series, all the Centris and Quadra Macs except the 610, and all the Power Macs except the 6100.

The OrangePC cards come in three models: all three support up to 64MB of system RAM via a standard 72-pin SIMM slot. The 210 offers one serial and one parallel port, as well as

standard VGA video (640-by-480-pixel resolution at 16 colors). The Model 250 has one PCMCIA slot (which accepts Type I and Type II cards) and supports SuperVGA video (up to 1024-by-768-pixel resolution at 256 colors), while the Model 290 has a PCMCIA slot and parallel and serial ports plus SuperVGA video. You can access the PCMCIA slot through the Mac's back panel, so you need not open the Mac's cover to change peripherals, as previous OrangePC cards required. To use the serial and parallel ports on the Model 290 requires an optional cable.

Because the OrangePC is a PC running inside the Mac's case, programs can continue to run in one sys-

tem while the user has switched to the other system. The card does share video display and hard drives with the Mac, although a dedicated hard drive can be added via the PCMCIA slot for the Models 250 and 290.

The OrangePC software is in binary format, so it works with both 680X0 and Power Macs in native mode. With the software, the card can access the Mac's files through standard DOS and Windows commands. It can read virtual DOS hard disks created by Insignia Solutions' SoftPC and SoftWindows DOS emulators.

The OrangePC cards are shipped with MS-DOS 6.2; Windows must be purchased separately. Expected prices range from \$999 for a 33MHz 486SX-based Model 210 with 4MB of RAM, to \$2000 for a 66MHz 486DX2-based Model 290 with 16MB of RAM. Orange Micro, 714/779-2772.

—GALEN GRUMAN



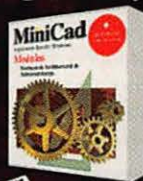
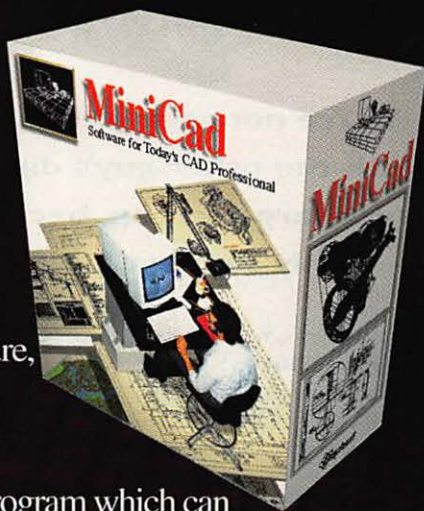
# Should the New MiniCad 5 be your CAD Program?

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Accelerated for  
Power Macintosh

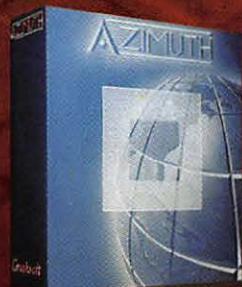
- I want a full-featured, proven market leader which can handle any job: 2D, 3D, cost estimation and client presentations.
- I want a program that runs on both the 68K-based Macintosh and the Power Macintosh. At no extra charge!
- I want a CAD program that is tailored to my needs, with specialized tools for architecture, mechanical engineering and design.
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- I want an established company with constant R&D funding, so that my investment stays safe.



### 3 Free Application Specific Modules Mechanical, Architectural, & Advanced Design

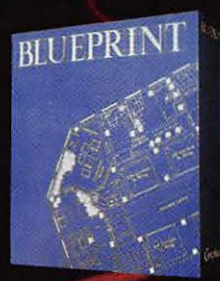
MiniCad 5 offers all of the above and more. The award-winning software has been hailed as the "features champion" by Macworld Magazine (March, 1993). Further, Graphsoft is dedicated to aggressive investment in CAD R&D. Graphsoft customers stay more productive than their competitors because Graphsoft supports both the latest technology and evolving user needs. MiniCad has long been the price/performance leader in Macintosh CAD. Don't be steered away from MiniCad by VARS who want you to buy high-priced CAD products that are hard to learn and only do a few things well. The VARS won't tell you that MiniCad 5 ships with a multi-media training CD, or that you receive 18 months of free technical support with Graphsoft products or upgrades. In short, MiniCad keeps more of your money in your pocket. Buy MiniCad 5 and save!

MiniCad 5 also includes: speed increases up to 100% even on 68K-based Macintoshes, a Claris CAD conversion program including a \$495 upgrade price, a Claris CAD translator, and a helpful conversion guide, translators for importing and exporting to the other major CAD products, an upcoming Windows version, multi-media training CD 18 months of free technical support and a no-hassles 30-day money-back guarantee through authorized dealers. Contact Graphsoft today for detailed literature. To order immediately, call MacWarehouse, MacConnection, or your local dealer. Demo: \$19.00 Buy MiniCad 5 and save!



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Circle 46 on reader service card





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True 60 field/sec [640 x 480] video capture & playback	YES	YES	30-field capture 60-field playback
24-bit color on large screen displays up to 21-inch at 1152 x 870	YES	NO	NO
QuickDraw acceleration	YES	NO	NO
Pro Features: Device control	YES	NO	Optional encoder with genlock for \$649
SMPTE time code	YES	NO	
RGB video input	YES	NO	
Price	\$4199	\$4499	\$1799

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YOUR VISION.**



Circle 90 on reader service card



# PowerPC News

## Next PowerPC Chip on the Way

IBM, MOTOROLA PRODUCE FIRST SAMPLES OF THE 604

IBM and Motorola have both produced the first units of the PowerPC 604 CPU, the eventual successor to the 601 used in the current Power Macs. IBM expects full production from the two companies' fabrication plants by October. Apple has said that it will use the 604 in some second-generation Power Macs, expected in early 1995.

The 604 will initially be available in a 100MHz version, although faster and slower variants are planned.

In low-level tests, the 604 is about 200 percent as fast at integer calculations as the 601, according to IBM. For floating-point calculations, it is only 120 percent as fast. IBM decided to focus on integer speedup on the 604 because that's the most common type

of calculation a CPU makes.

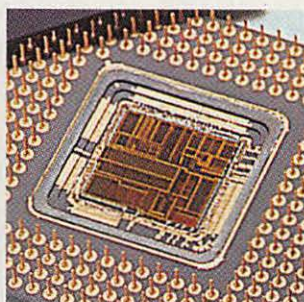
The 604 consumes 10 watts of power, compared with the 601's 8w, the 68040's 5w, the 60MHz Pentium's 12w, and the 90MHz Pentium's 4w. IBM has also produced a 4w, 100MHz 601 CPU, which should ship in quantity this fall.—GALEN GRUMAN

## 90MHz Pentium

INTEL'S CHALLENGE TO POWERPC FALLS SHORT

A week before the introduction of the Power Macs, Intel unexpectedly announced—almost three months earlier than originally planned—its power-efficient 90MHz and 100MHz Pentiums; and it began shipping them in limited quantity in early March.

Macworld Lab tests on a prototype 90MHz Pentium PC show that it is still slower than both the Power Mac 7100/66 and 8100/80.



Intel's new Pentium is better, but no match for PowerPC.

Code-named the P54C, the new Pentium 735 and 815 CPUs use 3 to 4 watts of power—that's less than a Motorola 68040 or IBM PowerPC 601. PC makers have already shown prototype systems based on the new Pentiums, but the CPUs' prices are high (\$849 and \$995, respectively: more than twice an 80MHz PowerPC 601's price. However, Intel plans to lower prices on a quarterly basis.

Intel also released clock-tripled \$475 75MHz and \$580 100MHz versions of its 486DX chip called the Intel-DX4 319 and 435. Both the

new Pentiums and DX4s are designed to work in notebook as well as desktop PCs.

—GALEN GRUMAN

## Power Watch

THE LATEST PRODUCTS FOR THE POWER MACS

Apple has announced prices for its Power Mac upgrades: The Power Macintosh Upgrade Card, which works in a IIfx, IIfx, Performa 600, and all Centrises and Quadras but the AV models, costs \$699. A motherboard replacement that changes a Centris or Quadra 610 or 660AV to a Power Macintosh 6100/60 costs \$999 (to a 6100/60AV, \$1399); to change a IIfx, Centris 650, or Quadra 650 to a 7100/66 costs \$1499 (to a 7100/66AV, \$1699); and to change a Quadra 800 or 840AV to a 8100/80 costs \$1899 (to a 8100/80AV, \$1999). A 256K cache card for the 6100 and 7100 costs \$299. Apple, 408/996-1010.

• DayStar Digital has decided not to offer PowerPC accelerators for the Mac II, IIfx, or Mac IIfx, saying the market is too limited. DayStar, 404/967-2077.

• Microsoft plans to ship Excel, FoxPro, Word, Works, and PowerPoint for Power Macs by summer. Upgrades are free for owners of 680X0 versions bought after March 31, 1994. Microsoft, 206/882-8080.

• Adobe Systems has new versions of Illustrator and Premiere for PowerPC and 680X0 Macs. Adobe, 415/961-4400.—GALEN GRUMAN



## New 90MHz Pentium: No Match for Top Power Macs

Best result in test. Times are in seconds. Shorter bars are better. Products are listed in decreasing order of overall performance.

### APPLICATION TESTS

#### Photoshop 2.5

File opens, unsharp mask, and RGB-to-CMYK conversion.

#### PageMaker 5.0

File opens and font changes.

#### Painter 2.0

Apply surface texture and adjust dye concentration.

#### Mathematica 2.2.1

Computations and their graphical rendering.

### OVERALL

Times as fast as a 66MHz 486DX2 PC. Weighted average of all results.

	Photoshop 2.5	PageMaker 5.0	Painter 2.0	Mathematica 2.2.1	OVERALL
Power Mac 8100/80	30.2	26.3	6.0	227.3	2.1
Power Mac 7100/66	31.7	28.7	7.0	283.4	1.9
Intel 90MHz Pentium PC	72.8	21.1	9.2	334.0	1.6
Power Mac 6100/60*	35.9	35.4	8.3	425.0	1.5
Compaq Deskpro 5/60M	54.0	22.8	12.7	395.0	1.4

\*The Power Mac 6100/60 was the only system tested without a 256K cache. On the Power Mac 6100/60 and 7100/66, the cache is optional.

**BEHIND OUR TESTS** Macworld Lab compared Power Macs against Windows PCs using top Intel CPUs: a 60MHz Pentium 510 in a Compaq Deskpro 5/60M and a 90MHz Pentium 735 in an Intel-manufactured prototype PC. All systems had 16MB of RAM, and we ran them in 16-bit color (the PCs used a Diamond Computer Systems SpeedStar Pro video card). We used beta versions of native PowerPC software for the Power Macs and current versions of Windows software for the PCs. (When PowerPC software ships, Power Mac performance should be somewhat higher.) Disk access was fairly sluggish on the Intel prototype (as the Photoshop results show), so shipping PCs based on the 90MHz Pentium should be faster—closer to Power Mac 7100/66 performance.



# IT'S GONE. AND YOU DIDN'T BACK IT UP.

FACE IT. YOU NEED to back up your files. Use Retrospect, the number one Macintosh backup software — backing up over one million Macs, at last count.

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searching for what's missing months later. And what if there's a fire, theft, flood, or equipment breakdown?

With Retrospect from Dantz you'll be backing up to the storage device of your choice in seconds — including SyQuest,

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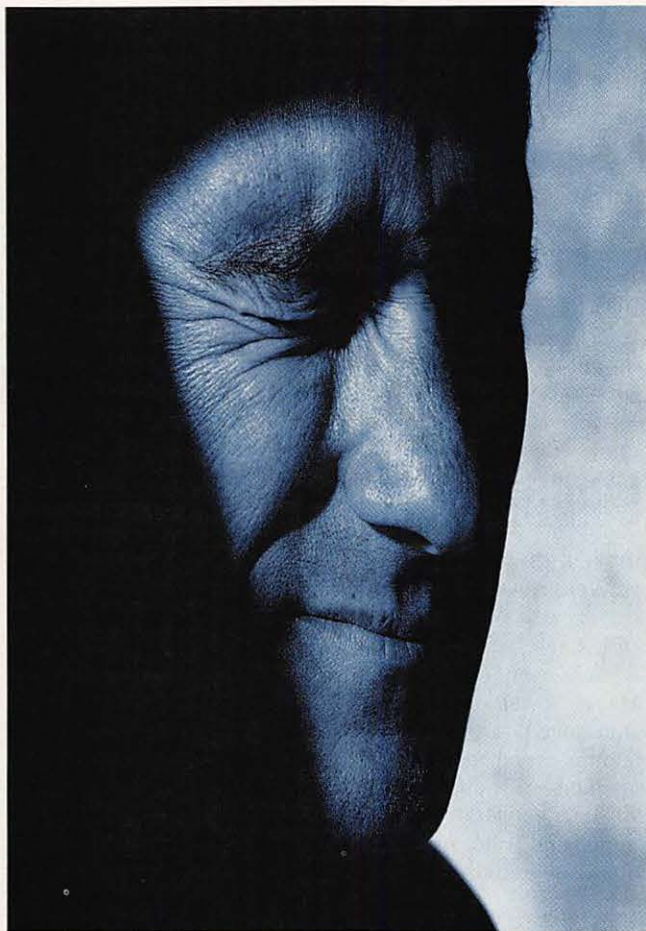
Retrospect packs more power than all the others put together.

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**SPEED.** Retrospect's customized drivers and interleaved data flow operate SCSI storage devices 20%-100% faster than any other backup software — guaranteed.



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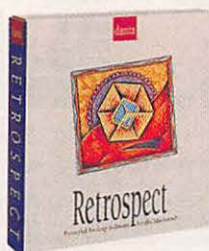


Macintoshes and include them in your backup scripts.

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# New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY MACWORLD. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS, WITH 1MB OF RAM, RUNNING SYSTEM 6. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY MACWORLD. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

## HARDWARE

### LaserLeader Mark 9315 and 9320

These workgroup printers can print up to 400 by 400 dpi on 11-by-17-inch paper and are designed to exist in multiple-protocol network environments. Both support PostScript, HPGL, HPGL/2, and HP PCL-4, and can be connected via EtherTalk, DECnet, Token Ring, LocalTalk, Novell NetWare, Banyan VINES, and TCP/IP. The printer comes with five open interface slots—you tell the company how you want the printer configured (Ethernet and Token Ring interfaces cost extra). All ports are simultaneously active, and the print controller automatically senses and switches emulations. The printers ship with 32MB of RAM



LaserLeader Mark 9320

(which is expandable to 64MB); a 1.44MB floppy drive; and an internal 85MB hard drive with 35 PostScript and 27 HP PCL fonts loaded. The Mark 9315 prints at 15 ppm, while the 9320 goes up to 20 ppm. A three-tray option is available for both printers. 9315 \$4795; 9320 \$5375; Ethernet interface cards \$395; Token Ring interface cards

\$995. BGL Technology Corp., 805/987-7305; fax 805/987-7346.

### LitePro 540

Geared toward the presentation of graphics and animation, this 19-pound color projector uses an active matrix LCD that can display 1.4 million colors simultaneously from a palette of 16.7 million colors. The device can project a 15-foot diagonal image of a 640-by-480-pixel image. The projector plugs into the video-out port of any Macintosh, and an included remote control can be used to adjust display parameters (for example, brightness, contrast, hue). \$7499. In Focus Systems, 503/692-4968, 800/294-6400; fax 503/692-4476.



LitePro 540

### Mac Imagination Pak

CD-I developers, take note. The Imagination Pak is based on a NuBus card that allows Macs to recognize and play back CD-I discs from a regular CD-ROM drive. The Authors version of the Pak includes the MediaMogul 2.0 multimedia authoring package for non-programming producers, as well as script2disc 2.0. A Studio version adds CD-I plug-ins for Adobe Photoshop, Color It 3.0 from MicroFrontier, and Equilibrium Technologies' DeBabelizer. Authors Pak \$16,000; Studio Pak \$18,500. OptImage, 515/225-7000, 800/234-5484; fax 515/225-0252.

### MK/5

Don't have space on your desktop for one more disk array? Then put that baby in a rack. Mega Drive Systems' latest line of arrays support RAID levels 0, 3, and 5; come with a SCSI-2 Fast/Wide interface; and are rack mountable. The systems feature an LCD configuration-panel that covers drive, power supply, fan, and component status. Users can execute built-in diagnostics or reconstruct drives on the fly from the panel. MK/5 owners must use the company's Mercury line of pluggable hard drives. 10GB \$22,700. Mega Drive Systems,

310/247-0006; 800/322-4744, ext. 400; fax 310/247-8118.

### Olympus 128MO Macintosh

Based on Olympus's own mechanism, this external, SCSI magneto-optical drive stores up to 128MB on standard 3.5-inch MO disks. The drive features an average seek time of less than 38ms, and a data-transfer rate of up to 768MB per second. The drive ships with Formatter-One Pro formatting and driver software by Software Architects, and the package supports Apple's SCSI Manager 4.3. \$1195. Olympus, 714/753-5935, 800/347-4027; fax 714/453-4468.

### PanelBook 530

At 9.5 by 11.5 by 2 inches, this portable color LCD projection panel is small enough to take nearly anywhere there's an overhead projector. The 8.5-inch-diagonal active matrix screen can simultaneously project 1.4 million colors (from a palette of 16.7 million) at 640-by-480-pixel resolution. The panel comes with built-in NTSC and PAL jacks for displaying composite video, and it connects to the video-out port of any Mac. \$5299. In Focus Systems, 503/692-4968, 800/294-6400; fax 503/692-4476.

### Power Array

For those with modest array requirements, this enclosure has only two drive slots. The product has a SCSI-2 Fast/Wide interface, and supports RAID levels 0, 1, and 5. As with other Mega Drive arrays, customers must use the company's Mercury line of removable hard drive modules. Drive modules can be key locked for additional security. 1GB \$2899. Mega Drive Systems, 310/247-0006; 800/322-4744, ext. 400; fax 310/247-8118.



Power Array

### SC-726MXL and SC-726UXL

Don't let the beguiling names fool you—these 17-inch color monitors feature a .26mm dot pitch and digital controls, are MPR-II- and Energy Star-compliant, and sync to multiple signals at resolutions



SC-726MXL

up to 1280 by 1024 pixels. The UXL produces vertical refresh rates of up to 60Hz, while the MXL goes up to 72Hz; both come with tilt-and-swivel stands. SC-726UXL \$959; SC-726MXL \$1099. Samtron Displays, 310/802-8425, 800/726-8766; fax 310/802-8820.

### SledgeHammer Wide and SledgeHammer II

When your data absolutely, positively had to be there five seconds ago, disk arrays can give you the speed you need. Products in FWB's SledgeHammer Wide family ship with an external array enclosure, a SCSI JackHammer (the company's NuBus SCSI-2 board), RAID ToolKit software, and cables. The SledgeHammer II line adds a second SCSI-2 card to the package. Depending on how the arrays are configured, average effective seek times range from 4.25ms to 4.75ms, and users can expect sustained data-transfer rates ranging from 8.1 MBps up to 11.5 MBps. SledgeHammer 2000-Wide (2GB) \$4129; SledgeHammer 2000-II (2GB) \$4729. FWB, 415/474-8055; fax 415/775-2125.

### Vista Printing System

A large-format, 300-dpi PostScript color ink-jet printer and raster image processor (RIP). The product can print CMYK images up to 36 inches wide by 18.2 feet long on a variety of materials. The RIP server functions as a print server and spooler, and users can preview a job, adjust scaling and rotation, and monitor use of ink and materials, all from the server display or a remote location. The Vista System supports EFI's EFiColor Color Matching System, and supports EtherTalk and LocalTalk (autosensing). \$19,995. NewGen Systems Corp., 714/641-8600, 800/756-0556; fax 714/641-2800. *continues*



## SOFTWARE

### AccuPrompt

Television personalities should never be at a loss for words, and this teleprompting software can help keep them speaking smoothly. Users can import formatted files from several popular word processors (via Claris's XTND technology), queue them up in the order they're to be read, and edit them with a built-in word processor. Dynamic sliding time scales display elapsed and remaining time for both the current script and any that are on deck. The software can also turn the text display upside down for use with a camera or podium-mounted monitor. Requires System 7, Mac II. \$3990. Questar Systems, 404/956-0700; fax 404/956-8781.

### Afrocentric Klips Sampler Library 1

Culturally specific clip art featuring African-Americans in business, at church, and at home. Includes black-and-white and color illustrations in EPS, PCX, and TIFF formats. Topics include Children, Black Church, Brothers, Black Families, Occupations, Kenté patterns, Health, Sisters, and Couples. \$79. Afrocentric, 312/463-6269; no fax.

### Animation:Master

A rendering-and-animation package based on Will Vinton's Playmotion. The modeling interface is spline-based, and the package features channel-based motion for more realism than is tradi-

tionally available to animators, according to the manufacturer. Users can create custom textures and materials and animate them along with the object they're applied to. Also, hierarchical model segments may be smoothly joined with the Skin command, and images may be loaded for rotoscoping or for use as modeling templates. 5MB min. memory; requires Mac II, FPU. \$1059. Hash, 206/750-0042; fax 206/750-0451.

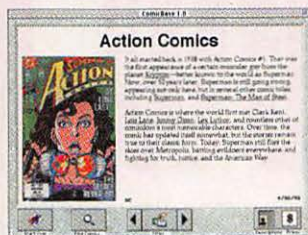


Animation:Master

### ComicBase

Leapin' lizards! This comic book encyclopedia and database includes color illustrations and information on nearly 300 titles in all genres from romance to war comics to superheroes. Market and appraisal information for the last four years are included, and you can create inventory reports, reports of the total value of your collection, plus checklists of issues needed to complete your collection. Selected words and titles are hyper-text-linked to one another, so if you're reading about Thor appearing in an issue of *Spider Man*, you can click on Thor's name and go straight to his entry. A read-only Comic Show feature allows

visitors to browse through your collection without making changes. Requires Mac SE. \$149. Human Computing, 408/774-9016; fax 408/774-9016.



ComicBase

### Cron Manager

Let's say that every day at 4 p.m. you update the chart you're keeping on the number of trips you make to the coffee machine. When you place this control panel in your System Folder and restart, it creates a Cron Events folder, and any file placed within that folder opens at the date and time specified in its name. You can tell a file (folder, document, or application) to open once at a specific date and time, or you can create recurring events: each day at a specific time, Cron Manager opens an appropriately named document. Requires System 7. \$26.95. Orchard Software, 617/876-4608; no fax.

### Doodle-mation

You mean you're still doodling with a pencil and paper? How low-tech. After you choose a set of shapes and lines, set their behavior controls, and click on Go,

they fly around your screen, leaving trails, growing, shrinking, bouncing, and interacting with each other. You can change shapes' patterns as they fly, assign sounds to patterns and events, cycle the colors, and save your favorite patterns and animations as After Dark screen-saver modules. You can even doodle on your screen saver while it's running. 2MB min. memory; requires Berkeley Systems' After Dark to display screen saver. \$29.95. Screen Magic, 415/648-8056, 800/336-2947; fax 415/647-2448.

### Fast Pitch Pro

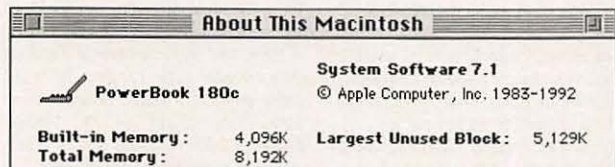
A HyperCard XCMD that lets users make multimedia presentations and control them (forward and reverse) with a single mouse-click. Presentations can include any combination of text, color paint, sound, pictures, QuickTime movies, laser disc media (with Videodisc plug-in sold separately), and audio CD media (with Pro AudioCD plug-in sold separately). This XCMD includes a run-time option so that users can create stand-alone slide stacks. Requires HyperCard 1.1 or HyperPlayer. \$79.95. Object Systems, 317/898-4017, 800/859-9543; fax 317/898-4017.

### Icon Mania

It may be hip to have a customized desktop, but tweaking those tiny icons can be less than rewarding. This application helps users create and apply icons to both folders and files in several ways. For instance, users can drag a graphics

# Double your RAM.

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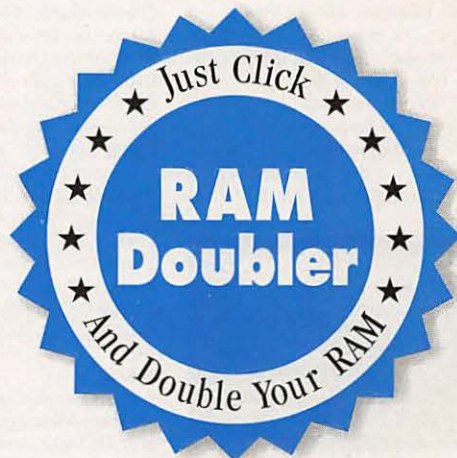
RAM Doubler is an extension that works by reclaiming memory not being used. MacWEEK says "RAM Doubler couldn't be easier to use." It is the latest from Connectix, the Macintosh memory experts and makers of the award-winning CPU and MODE32.

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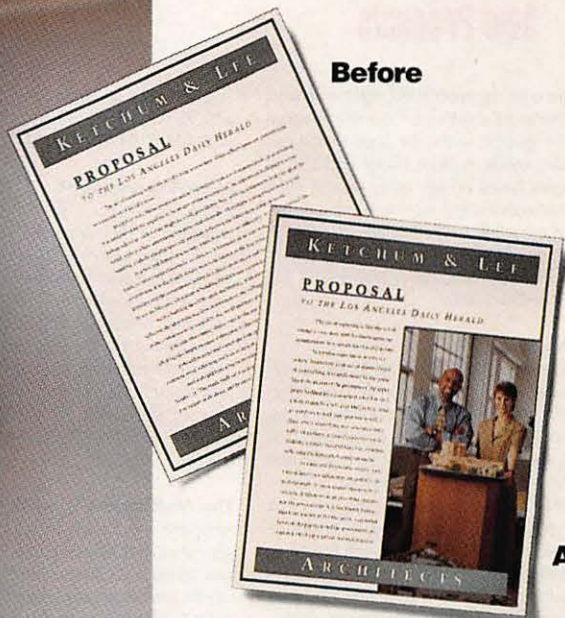
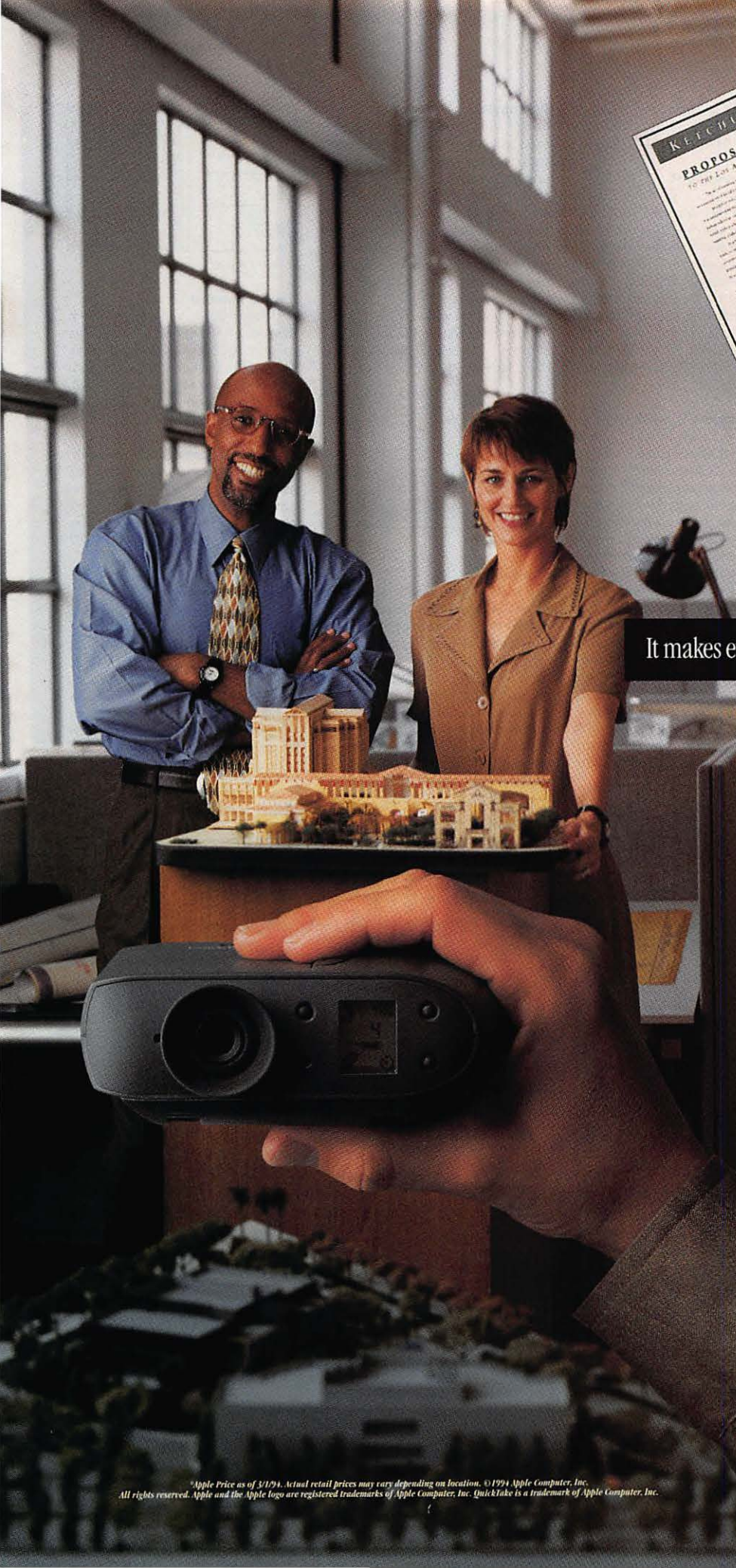
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## New Products

file onto the application, and Icon Mania changes the file's icon to a thumbnail of the graphic in the file. Icon Mania can also create custom folder and button icons based on any other icon. A color icon editor is also included, as is a library of over 800 icons. Requires System 7, color. \$69.95. Dubl-Click Software, 818/888-2068, 800/266-9525; fax 818/888-5405.

### MacSpeakerz 3.0

The latest version of this loudspeaker-design application can analyze six different box types as well as isobaric variations on each of these. Specifically, the software can now analyze third-order closed-box types, as well as fourth-, fifth-, and sixth-order band-pass box types. MacSpeakerz suggests enclosure volumes and tunings for each box type, and the manual currently includes a tutorial for those who are new to speaker design. \$299. True Image Audio, 619/480-8961, 800/621-4411; fax 619/480-8961.

### MasterCook II

In addition to containing more than 1000 recipes, this software has nutritional information ranging from fat content to sodium level on every ingredient in its database. Users can search for foods or recipes based on several criteria, including ingredients, nutritional information, and time needed to prepare a dish. Users can recalculate recipes to feed up to 999 people, and can generate menus or diet plans with four meals a day for up to 31 days. MasterCook

software also generates shopping lists. \$29.95. Arion Software, 512/327-9573, 800/444-8104; fax 512/327-3786.

### MicroExpressionist

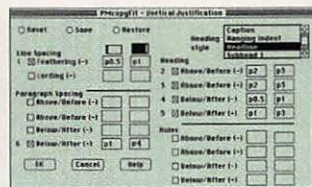
Designed for users who need math equations in their documents but don't need a full-blown equation editor, this package is a slimmed-down version of Prescience's Expressionist. The smaller package features simplified palette and menu choices; and it lets users cut and paste equations directly into word processing, page-layout, or presentation software. \$79. Prescience Corp., 415/543-2252, 800/827-6284; fax 415/882-0530.

### The Multimedia Workshop

Here are some tools for the younger generation—this three-part package lets kids create and edit multimedia presentations encompassing text, still images, audio, and video. In the Writing Workshop, kids plan, lay out, edit, and print traditional text and graphics documents; optionally, the Mac can read all text aloud. The Video Workshop has basic video-editing tools: users select a background and a video clip, add narration, and assemble their clips in the Sequencer. Finally, the Paint Workshop is for creating illustrations or customizing photos or clip art. Libraries of photos, sound effects, music, QuickTime movies, and clip art are also included. 4MB min. memory; requires Mac LC, System 7. \$79.95. Davidson & Associates, 310/793-0600, 800/545-7677; fax 310/793-0601.

### PMcopyFit

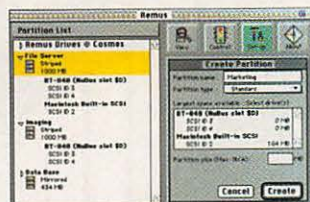
Instant, automatic, vertical copyfitting from within PageMaker can be yours with this PageMaker Addition. You set justification points between text lines, above and below heads (multiple heads are respected), above and below paragraphs, and above and below horizontal rules. Once you've got it just the way you want it (including the order of precedence for these operations), you select the text you want to justify, sit back, and let your Mac do the dirty work. Requires PageMaker 5.0. \$99. EDCO Services, 813/962-7800, 800/523-8973; fax 813/960-2356.



PMcopyFit

### Pop-In Parts

Clip art features components that are found in technical illustrations. Volume 1 contains rings, springs, pins, and threaded fasteners. Volume 2 contains meters, lights, numerical displays, switches, knobs, electrical plugs, cables and sockets, and cooling fan grilles. Both volumes have several two-dimensional and three-dimensional views of each object, and illustrations are in EPS format. \$49 per volume. Tech-M, 813/576-1884; fax 813/577-7207.



Remus Limited

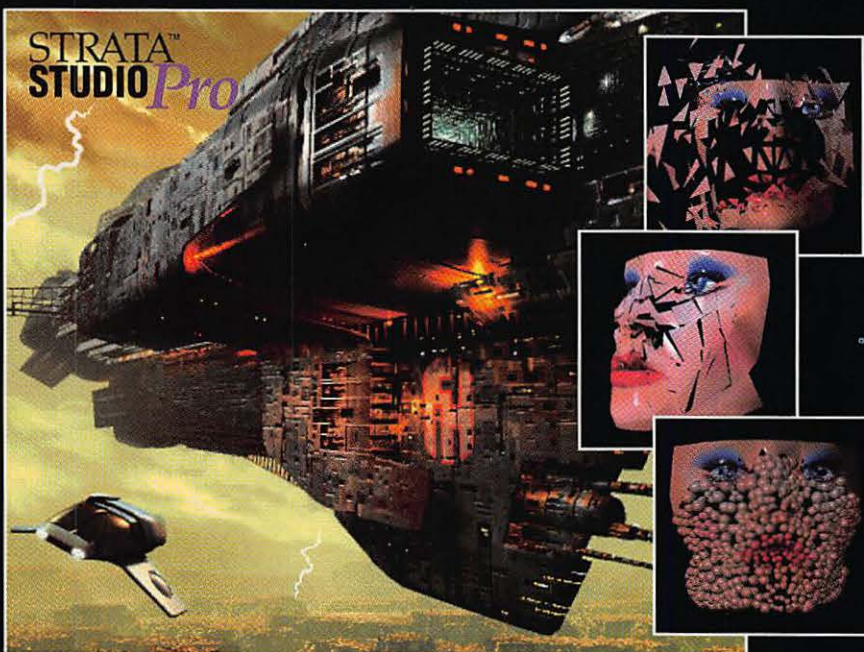
### Remus Limited

A stripped-down version of Trillium Research's RAID software, this package supports RAID levels 0 and 1 over the Macintosh's built-in SCSI port or SCSI controllers from Atto, BusLogic, FWB, and others. Formatting and partitioning software is included, and the package alerts the user to failures via alert windows, sounds, and network messages. Remus Limited can also report to some network troubleshooting notification systems, including Caravelle's Networks. 4MB min. memory; requires Mac II, System 7. \$295. Trillium Research, 715/381-1900; fax 715/381-1901.

### Scenery Animator

Using data from the U.S. Geological Survey, this software renders 3-D landscape scenes both real and imagined. Visit Yosemite, the Grand Canyon, Hawaii, Mount Saint Helens, and a lunar landscape—other landscape models are also available. Users can create pictures from any perspective, or draw a flight path for animation. Light levels, landscape color, cloud levels, and snow level are all *continues*

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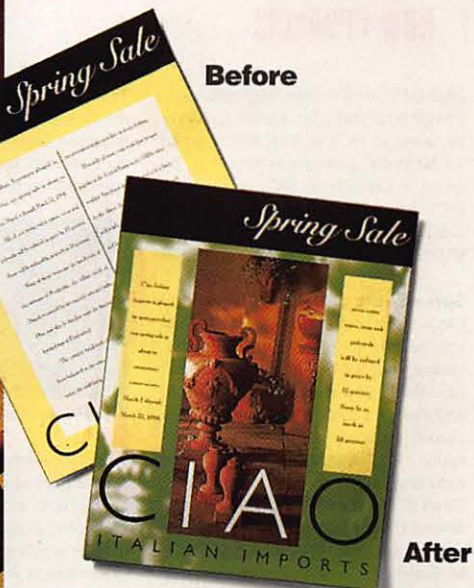
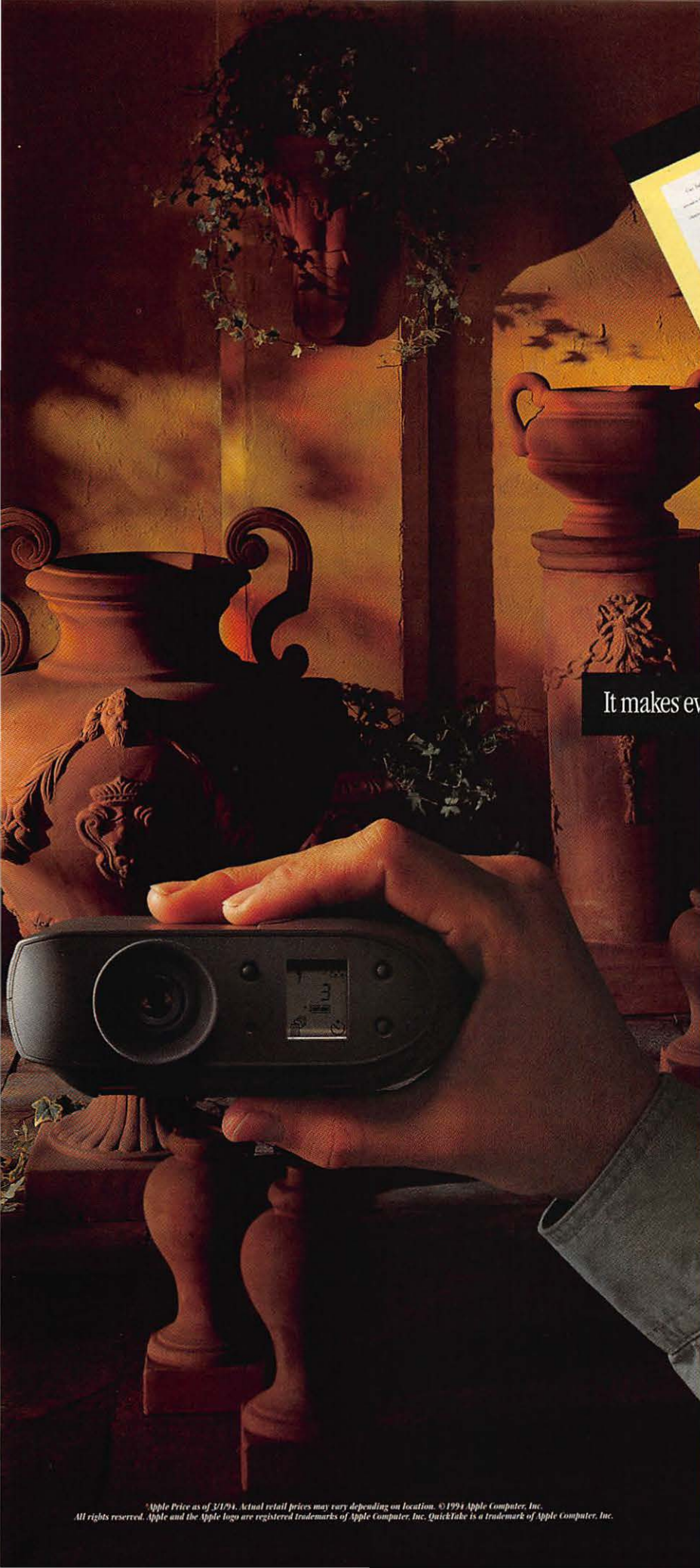


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## New Products

adjustable, and scenes may optionally include trees and lakes. Landscapes may be saved as PICT or TIFF files in up to 24-bit color, and animations may be saved as QuickTime, PICS, or separate PICT files. 4MB min. memory; requires 8-bit color. \$149. Natural Graphics, 916/624-1436; fax 916/624-1406.

### Spreadware Statistics Menu

Once this Excel add-in is installed, all you have to do is select the cells containing your data, choose the statistical calculation you wish to perform on it, and then pick a cell where you want the output. Version 3 of Statistics Menu features new nonparametric routines including Dunn's multiple comparisons, Kruskal-Wallis one-way ANOVA, and several chi-square routines. All routines are also available through Excel's macro language. Requires Microsoft Excel 4.0. \$129. Spreadware, 619/347-2365; fax 619/347-6045.

### Sword of Sodan

Talk about a job for Superman—you must avenge the death of your father, the king, and free the cities of the Northern Kingdom from the tyrannical reign of Zoras the evil. This fantasy role-playing game comes with castles and dungeons, vile creatures, and all manner of magical items. Can you survive Castle Graggamore long enough to unseat the foul fiend that holds your land in thrall? 4MB min. memory; requires System 7, Mac II, 256 colors. \$49.95. Bethesda Softworks, 301/926-8300, 800/677-0700; fax 301/926-8010.

### Tree Professional

If only creating trees were as simple as modeling them on your Mac. This software models and renders trees, which you can then save as PICT or DXF files.



Tree Professional

You can model both broadleaf and conifer trees as well as adjust dozens of parameters, including trunk structure and color, bough structure and color, branch winding, leaf population, and crown spread. A 2-D-only version of the software is also available, as is a library of 33 broadleaf and 17 conifer trees, saved as Tree Professional parameters. 4MB min. memory; requires Mac II, FPU, 8-bit color, 13-inch monitor. Tree Professional \$695; Tree 2-D \$149; Tree Library \$129. Onyx Computing, 617/876-3876; fax 617/868-8033.

## CD-ROMS

### Mac Cocktail 1.5

The drinks are on your Mac with this disc of over 200 contemporary and traditional cocktail recipes. Each drink is pictured alongside a list of ingredients, with instructions and tips for mixing them.

Basic mixology and garnish practices are illustrated with QuickTime movies. Users can search for drinks by name or by ingredients, and the disc includes a primer on the history and usage of common spirits. Users can also edit drink recipes and add their own drinks. \$79.95. Blackfire, 310/798-0202, 800/556-7207; fax 310/379-1182.

### PowerTools

Just got to have shareware, but you don't have a modem to download it? This disc offers over 5000 pieces of shareware, freeware, and public domain software in 15 categories, including Applications, Arts & Graphics, Business, Communication, and Utilities. The disc ships with a browser to fleetly ferret out files. \$79.95. Softbit, 714/251-8600; fax 714/261-7977.

### Sound Library Pro

More than 1200 digitally recorded sounds in six main categories: Animals, Household, Instruments, Nature, Special Effects, and Voice. Each sound comes in 22kHz and 11kHz versions (both 8-bit



Sound Library Pro

mono), and all sounds are supplied without extensive copyright restrictions. A MacroMind Director-based navigator is included. \$49. Wayzata Technology, 218/326-0597, 800/735-7321; fax 218/326-0598.

## ACCESSORIES

### KeyStone

Jealous of how many keyboard/mouse/trackball devices PC users have to choose from (and how little they cost)? This box plugs into your Mac's ADB port and provides a 5-pin PC-AT-compatible keyboard port, a 9-pin PC-mouse port, a pass-through ADB port, and a power-on switch for Macs. Included control panel software lets you assign actions to three-button mice, control mouse tracking and click speed, and remap your  $\text{⌘}$  and option keys to equivalent keys on the new keyboard. The unit draws its power from the ADB port, but it cannot be used with a PowerBook. \$99. Silicon Valley Bus Company, 408/623-2300, 800/775-0555; fax 408/623-4440.

### PocketNet 2001

Being able to plug into a LocalTalk network or a phone line can be twice as important while you're on the road, but you consider yourself lucky if it's only twice as difficult. This kit includes a modem/network phone cable on a retractable coil; an adapter that plugs into most common home, business, and

continues

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# A simple demonstration of PhotoFlash software.

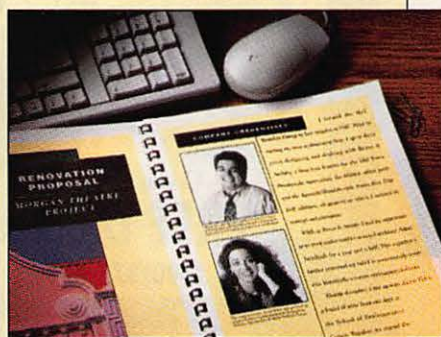
(A complicated demonstration isn't possible.)



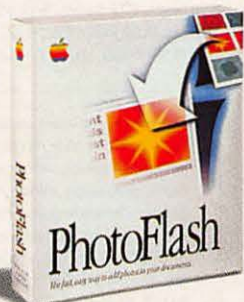
**1. Find a photo.** The PhotoFlash Brouser makes it easy to view and pick a photo—they're all stored here, whether you got them from a CD, scanner or digital camera.



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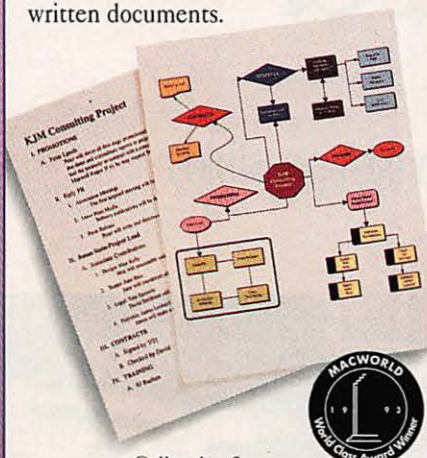




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## New Products

hotel (analog) telephone systems; two PhoneNet connectors; and a mini How To Connect guide. A modem-only version (PocketNet 2000) is available sans PhoneNet connectors. The retractable cable is available alone as the PocketNet 2002. PocketNet 2001 \$59.95; 2000 \$29.95; 2002 \$19.95. Pilot Technologies, 612/828-6002, 800/682-4987; fax 612/828-6806.

### Rolling Colors Trackballs

The only problem with PowerBooks is that they're so lifeless—so completely without personality. Fortunately, you can spice up your boring PowerBook with a brightly colored trackball. The 30mm Rolling Colors Trackballs fit most non-Duo PowerBooks (models 140 through 185c), and you get three of them: one green, one yellow, and one magenta. \$14.95. CoStar Corp., 203/661-9700, 800/426-7827; fax 203/661-1540.



SunPack PB

### SunPack PB

A sunny day at the beach—just perfect for catching up on a little work on your PowerBook, right? It is if you're using this pair of solar panels for power. Together the panels measure 23 by 16.5 inches (11.5 by 16.5 folded for storage), and they provide enough juice to run a standard PowerBook in full sunlight. In less than full sunlight, the SunPack can still charge the battery. The panels connect to the PowerBook with a 6-foot power cord. \$229. Keep It Simple Software, 406/442-3559, 800/327-6882; fax 406/442-1316.

## BOOKS

### The Macintosh 3-D Workshop

For beginning to intermediate users who want to learn more about 3-D software and techniques, this book comes with a CD-ROM with try-out versions of Infini-D, Adobe Dimensions, formZ, Life Forms, MacroModel, ModelShop II, and Swivel 3D Professional. Author Sean Wagstaff covers 50 Mac 3-D-imaging software packages with examples of how the packages can work both separately and together. 485 pages. \$39.95. Hayden Books, 317/ 581-3500, 800/428-5331; fax 317/ 581-3550.

### The Macintosh Joker

There's one in every office. The one person who reads books like this to discover cruel tricks to play on his or her compatriots. Written by Owen Linzmayer, this book includes a disk with 33 control panels, extensions, and applications that do no harm to a victim's data or machine, but could cause extreme psychological trauma. By way of example, consider Mitten Touch-Typist, which randomly introduces errors as an unsuspecting user pecks away happily. 144

pages. \$19.95. Hayden Books, 317/ 581-3500, 800/428-5331; fax 317/ 581-3550.

### Net Guide

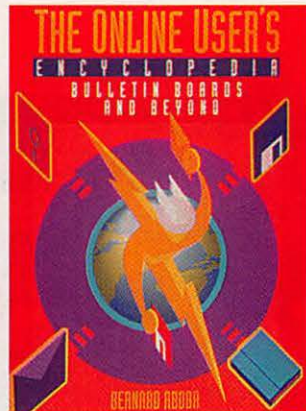
Presented in an A-to-Z reference format, this book contains over 4000 entries covering what's available online. Entries include recommendations of the best places to find or discuss a certain topic, cross-references to other topics, downloaded pictures, and money-saving tips. Written by Michael Wolff and Peter Rutten. 364 pages. \$19. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 800/659-2436.

### The Official Print Shop Deluxe Handbook

The third edition of this source book contains full descriptions of Print Shop Deluxe's new features; hundreds of designs applicable to home, school, and business; a chapter on five easy steps to good design; examples of the program's graphics and fonts; and dozens of layout ideas and suggestions. Written by Randi Benton and Mary Schenck. 320 pages. \$25. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 800/659-2436.

### The Online User's Encyclopedia: Bulletin Boards and Beyond

This comprehensive reference covers everything from the Internet to Bitnet to FidoNet. Readers can learn how to connect to global networks, and the book includes comprehensive listings of bul-



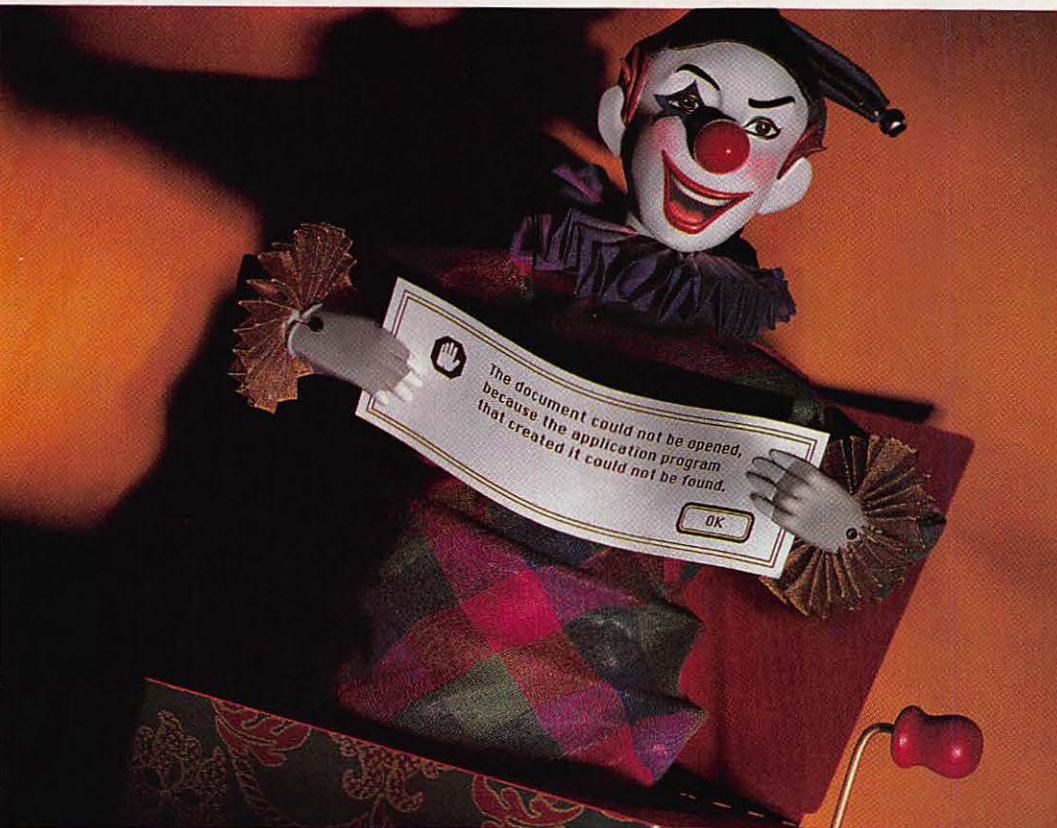
The Online User's Encyclopedia:  
Bulletin Boards and Beyond

letin boards and Internet service providers. Author Bernard Abood also includes chapters on the UUUP, ILink, and PostLink networks. Plus he covers file transfer, conversion, and compression on Macs, PC compatibles, and Unix machines. 832 pages. \$32.95. Addison-Wesley Publishing Co., 617/944-3700, 800/358-4566; fax 617/942-1621. **m**

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.



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Translates Graphics			✓	✓			
Translates Spreadsheets			✓	✓			
Translates Databases			✓	✓			
Can Connect Mac to PC via Cable or Modem			✓	✓			

\* Includes Macintosh PC Exchange. † File must be in special format; no editing capability.

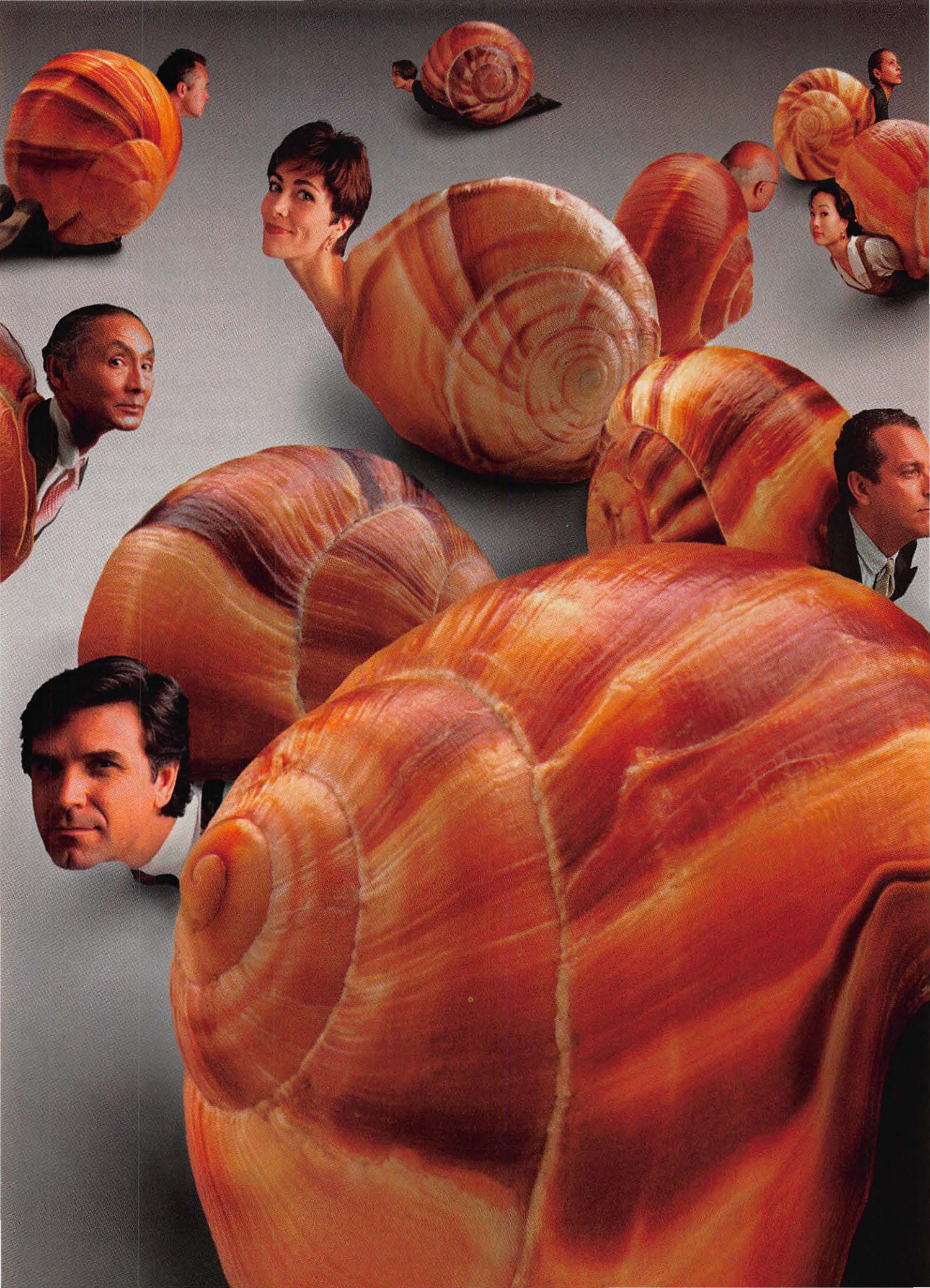
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JUNE 1994

# Reviews

## Power Macintosh 6100/60

### Macintosh Computer

**PROS:** Inexpensive; fast with native PowerPC software; built-in Ethernet; cache slot. **CONS:** Limited expansion. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** Base model \$1819.



**T**HEY'RE FINALLY HERE. APPLE HAS released the long-awaited Power Macintoshes, with the initial emphasis on the 6100/60 model. The 6100/60—which looks like a Quadra 610 and has the widest initial availability—uses a 60MHz PowerPC 601 CPU, the first in a new series of chips to which Apple will migrate the entire Macintosh line over the next two years (see “The Power Macintosh Arrives,” *Macworld*, May 1994).

### Performance Breakthrough

Macworld Lab tests clearly show that, using native PowerPC software, the entry-level Power Mac 6100 surpasses the performance of a 60MHz Pentium 510-based PC, which had put even Apple's Quadra and 840AV to shame. Not only has Apple finally regained the performance lead it lost about eight years ago when PCs appeared using Intel's 80386 CPU, but it has pushed far ahead. The Power Mac 6100/60 with no cache is about 5 percent faster than a 60MHz Pentium PC (which includes a cache), and the 6100 is the slowest of the three new Power Macs.

But there's a big “but” about Power Mac performance: you need to have PowerPC software to get it. Using your existing 680X0 software, you'll get significantly less performance on a 6100, roughly equal to that of a IIci. This is not Apple's fault: it's up to developers to deliver PowerPC software, something

that should start happening in great degree by fall. In the meantime, those who own 040-based Macs should wait until their key programs are available in PowerPC versions to switch; otherwise, they'll see a slowdown. Owners of 030-based Macs—except for IIfx and IIvx owners—have no reason to delay; their current programs will be a little faster on a Power Mac 6100.

### Near-Perfect Compatibility

The Power Mac 6100 looks a lot like a Quadra 610 or Centris 610 for good reason: Apple decided that the Power Macs should be as compatible as possible with the previous lineup. Macworld Lab tested more than 100 programs and found that only a very few 680X0 programs don't work on a 6100. They include Kent Marsh's CryptoMatic, Kiwi Software's Power Menus, Connectix Corporation's RAM Doubler, and Jump Development Group's OptiMem—all work with low-

level system software and hardware, making them the kind of program that will have incompatibilities with a new generation of Macintosh. Note that any 680X0 software that requires a math coprocessor won't work on a Power Mac; although the PowerPC has a built-in FPU, it's not compatible with the 680X0 CPUs' FPU.

Concerns over program compatibility should not dissuade you from getting a 6100. In fact, the degree of compatibility is better than what Apple achieved in its last three major transitions: first to 32-bit-clean systems, then to System 7, and finally to the 68040.

However, if you use accelerated video cards or similar INIT-enhanced hardware, you may lose some features. For example, accelerated 24-bit video cards need new INITs to run in accelerated mode, as well as to use some advanced features like on-the-fly resolution switching. SuperMac Technology and Radius have free INIT upgrades for current



STAN MUSILEK: SCREEN IMAGE BY ROGER HESSMYER/STARLIGHT



products; SuperMac also provides new ROMs for free, while Radius charges a nominal fee. Other developers had not finalized their plans at press time, so check first.

## What the 6100 Offers

Because of Apple's desire to make the Power Macintoshes look, feel, and behave like earlier Macs, the 6100 offers no revolutionary technology outside the PowerPC itself. But there are some differences, such as a video connector that's both old and new.

What's new is that the Power Mac has built-in resolution switching, so if you have a multisync monitor with the right kind of cable adapter (such as that in Apple's new 17- and 19-inch monitors or NEC Technologies' adapter for its current monitors), you can have the Mac expand or reduce the desktop view without restarting. Also new is a video port that doesn't use the standard Mac video connector; instead, it uses an AV-style connector. Apple includes an adapter cable so you can use existing Apple or multisync monitors. (The AV version of the 6100/60 includes a standard Mac-style video port as part of the AV card that goes into the 6100's PDS. You can use both ports simultaneously to connect two monitors.)

What's old is the return of RAM-based video—there's no video RAM in the 6100. That keeps Apple's costs down. However, the video display is about two-thirds the speed of a Quadra's VRAM-based video when using 680X0 programs. We didn't see this slowdown with beta PowerPC programs.

If you want more than 16-bit color depth for 14-inch monitors or 8-bit color for 16-inch monitors, you'll need to get a 7-inch video card and Apple's \$99 PDS-

to-NuBus adapter so you can connect the card to the 6100's Processor Direct Slot. Note that if you now have a Quadra or Centris 610, you cannot use its PDS-to-NuBus adapter. Also, if you have the 6100/60 AV, you can't add a video card because the AV card is installed in the sole expansion slot. Macworld Lab found that the AV card's video circuitry is only marginally faster than the circuitry for the back panel's port, so if you want AV capabilities as well as fast video, get a Power Mac 7100/66AV or 8100/80AV.

A less noticeable change to the 6100's bevy of ports is the use of GeoPorts for the serial (phone and modem) ports. The difference is that there's one extra hole in the port; current serial devices, such as fax modems, plug right in and run as always. The use of GeoPorts—coupled with Apple's bundling of the AV Macs' telephony, speech, and hi-fi stereo capabilities—should encourage developers to incorporate more AV technologies, such as software-based faxing through a GeoPort modem or phone pod. In fact, Apple bundles Express modem software to provide 9600-bps faxing through the GeoPort without a fax modem.

However, Apple engineers admit that some necessary operating-system extensions are needed to make telephony on the Mac a reality, and Apple's speech recognition still has a ways to go before it's practical. The real advantage of incorporating these AV technologies is the support for 16-bit audio.

Like all Power Macs, the 6100/60 includes an Ethernet port (you'll need a transceiver to connect to a network), a SCSI port, and a printer port. Apple offers models of the 6100 with CD-ROM drives (the type introduced in the Quadra 605 that has a built-in CD-ROM caddy). There's also a cache slot in which you can

put a 256K cache SIMM—something that boosts performance by about 10 percent.

## Goodies

Apple has added some interesting software onto the Power Macs' hard drive. One is a graphical calculator that does the kind of math you'd associate with rocket science—and it can even display the results graphically, which will make scientists and engineers happy. The Power Macs now also come with Macintosh PC Exchange 2.0, so your Mac can read PC drives (floppy drives, removables, and new to this version, hard drives), as well as AppleScript, so you can automate actions in programs like QuarkXPress that are scriptable. The AV version also comes with VideoFusion's VideoRecorder software, which lets you watch input from a TV or VCR in a window.

## Good Deal

Apple says that a capable Power Mac 6100/60—with a CD-ROM drive, 8MB of RAM, and a 250MB hard drive—should go for about \$2300, which is a great price. With a good multisync monitor, third-party extended keyboard, and another 4MB of RAM, you'll spend more like \$3300 for a system that should give you power to spare for several years. (Not that you won't feel some envy when faster Macs appear, as they inevitably do every six to nine months or so.)

The 6100 is hard to resist, given its price and performance. The limited expansion won't affect most users, and those for whom it is an issue (mostly graphic artists and publishers) will want a faster Mac anyhow. When developers offer in PowerPC format the software that most business users run daily, it'll be time to get a Power Mac 6100/60.

—GALEN GRUMAN



## Power Macintosh 6100/60: How Fast Is It?

### CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

#### Common

Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.

#### Scientific

We added to the common tasks several scientific calculations (which use floating-point math).

### BUSINESS-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world tasks within each class. For each type of system, results can be compared with other Macworld Business-System Performance Times.

#### Processor

Several tasks in Adobe Photoshop, Aldus FreeHand, Claris FileMaker Pro, and Microsoft Excel and Word.

#### Drive Access

File opens in Adobe Photoshop and disk-based sorts in Claris FileMaker Pro.

#### Video Display

Horizontal and vertical scrolling in Microsoft Excel and Word, and QuarkXPress.

#### Floating Point

Scientific recalculations (which use floating-point math) in Microsoft Excel and 3-D rendering in Infini-D.

■ Best result in test. Products are listed in increasing order of overall performance.



<sup>A</sup> Using 680X0 programs, since PowerPC versions were not yet shipping for our test programs. <sup>B</sup> Using the AV card's video connector.

<sup>C</sup> Could not perform Infini-D test because the 6100's 680X0 emulation includes no FPU, which Infini-D requires.



# Macintosh LC 575

## Macintosh Computer

**PROS:** Fast CPU; speedy 16-bit video; convenient, all-in-one cabinet. **CONS:** Limited expansion options. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** \$1699 with 5MB of RAM, 160MB hard drive, and internal CD-ROM player.



**O**K, LET'S MAKE A SHOPPING LIST. How about a Macintosh with a 33MHz 68040 CPU, built-in CD-ROM player (with a slide-out tray), 14-inch color monitor, 16-bit-color capability, a hard drive of at least 160MB, stereo speakers, and a microphone. Of course, a keyboard should be included in the box as well. And an upgrade path to Power Mac is also a must.

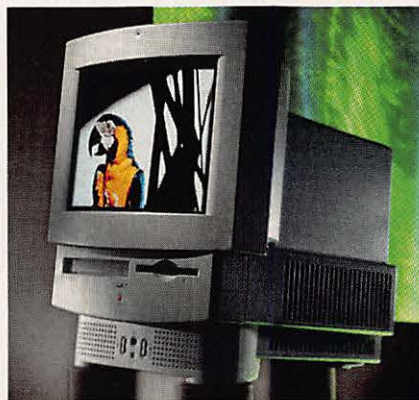
What's that, you only have about \$1700 to spend? Before you hit that buzzer, let me tell you that there is indeed such a Macintosh out there, available through Apple's educational distribution channels as the LC 575. (There are also consumer versions, the Performa 575, 577, and 578. For more on these, see *Mac-Bulletin*, in this issue.)

The LC 575, despite its larger size and hefty form (some 40 pounds' worth), should be considered a direct descendant of the original compact Macs, since it offers the same all-in-one solution.

The front of the LC 575 has a somewhat busy, high-tech appearance that I would label functional rather than attractive. At the top of the monitor is the microphone. The CD player is just beneath the monitor, on the left of the front faceplate. At the right is the floppy drive. The plastic grilles for the stereo loud-

speakers occupy most of the recessed bottom portion of the faceplate. Controls for screen brightness and volume are situated between the speakers, along with a headphone jack and power-on light. The main power switch and the standard Macintosh connection ports are at the rear.

You can snap out the logic board by holding down two plastic tabs on the computer's back panel, then sliding out the board itself, making expansion simple. Unfortunately, other expansion opportunities are few. You can only add one 72-pin SIMM (it will address up to 36MB of RAM). There's a single PDS connector and a special 2-by-6-inch communications slot where you can add either an Ethernet card or a specially designed version of the Apple Express modem. There is no provision for NuBus expansion.



Macintosh LC 575

The key expansion issue on the minds of many these days, though, is a Power Mac upgrade option. Apple has promised a Power Mac upgrade path for both the LC 575 and the LC 550 (which uses a 33MHz 68030 CPU), as well as other LC and Performa models later this year.

The internal CD-ROM player is the new Apple CD300 Plus, which is a multispeed, multisession drive with essentially the same performance specs as the older CD300 model. The biggest difference between the new design (which uses a Matsushita mechanism) and the previous model (which uses a Sony mechanism) is that those plastic CD caddies are history. The new player has a slide-out tray, just like an ordinary audio-CD player. It's a welcome change in my book.

The integrated monitor offers a bright, crisp, color picture, enhanced here by the internal video's 16-bit-color capability. The monitor is Energy Star-compliant, and a screen control panel can be set to power down the monitor after a preset interval. Clicking the mouse or pressing a key is all that's necessary to bring the screen to life.

Macworld Lab tests showed the LC 575 to be a brisk performer indeed. It is much faster than 68030 models and is clearly in Quadra territory, excepting the LC 575's inferior floating-point performance (it doesn't have an integrated FPU). Most Macintosh programs (excluding math and 3-D rendering) don't make FPU calls, so for most users, the lack of an FPU isn't a problem.

The integrated stereo speakers have a pleasant sound that's rather bass-shy—how about a bass-boost switch, Apple? The internal amplifier produces a reasonable volume, though it's far short of stereo levels.

The LC 575 (and its Performa equivalent) is an ideal choice for the student and for the small-business professional who wants high power and the convenience of having everything integrated into a single case. Even the power user in an office crowded with assorted Mac goodies might like having one of these around as a second computer. Either way, especially considering its low price, the LC 575 is hard to beat.—GENE STEINBERG



## Macintosh LC 575: How Fast Is It?

### CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

#### Common

Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.

#### Scientific

We added to the common tasks several scientific calculations (which use floating-point math).

### ENTRY-LEVEL-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world tasks. For each type of system, results can be compared with other Macworld Entry-Level-System Performance Times.

#### Processor

Several tasks in Claris FileMaker, ClarisWorks, Deneba UltraPaint, and Microsoft Excel and Word.

#### Drive Access

File opens in Microsoft Excel and Word, and disk-based sorts in Claris FileMaker.

#### Video Display

Horizontal and vertical scrolling in ClarisWorks, and Microsoft Excel and Word.

#### Floating Point

Scientific recalculations (which use floating-point math) in Microsoft Excel and ClarisWorks.





# Silentwriter 640

## Personal Laser Printer

**PROS:** Supports PostScript Level 2; attractive price; good quality and performance. **CONS:** Does not handle single sheets well. **COMPANY:** NEC Technologies (508/264-8000). **COMPANY'S SUGGESTED PRICE:** \$800.



**R**EMEMBER WHEN PEOPLE WERE IMPRESSED by the newsletters and fliers that you cranked out on your loud but reliable ImageWriter printer? Now even your kids' Little League schedule is probably output on a laser printer. These printers have become more affordable, but until recently only QuickDraw printers were available for less than \$1000. Today, you can buy a PostScript Level 2 printer for well under a grand.

The NEC Silentwriter 640 is a new member of the under-\$1000 PS Level 2

RAM stores the rasterized fonts for the file being printed, so printing is faster the next time you use those fonts.

## A Solid Performer

Using a 6-ppm NEC proprietary engine (the 640 is NEC's shift away from Minolta print engines) and a custom, application-specific integrated circuit (ASIC) that includes an embedded Motorola 68000 processor, the 640 is a capable performer. As Macworld Lab tests show, it's not in the same speed category as Apple's Personal LaserWriter 320 (which uses a 4-ppm engine but has a RISC processor that speeds printing of complex files). However, the 640 is considerably faster than DEC's DEClaser 1152. As it turns out, the timing results line up with the pricing of the three printers. The Apple printer costs slightly under \$1000, while the DEC goes for about \$700.

Overall, the LaserWriter 320 outperformed the Silentwriter 640. But in



Silentwriter 640 from NEC Technologies

## Paper Handling

Generally, the Silentwriter 640 represents hassle-free printing. But one problem area is paper handling. The Silentwriter's paper tray holds a respectable 200 sheets of paper and accepts single sheets fed manually. I tested the 640 with transparencies, envelopes, and a variety of paper weights. Feeding single sheets manually was tricky; it was difficult to tell when I had inserted a sheet properly. I endured about half a dozen error messages. And when I did get it to feed correctly, I wasn't sure exactly what I had



## How Fast Is the NEC Silentwriter 640?

**Best result for each test. Times are in seconds. Shorter bars are better. Products are listed in decreasing order of overall performance.**

### Multiple Fonts

Print speed for a typical 7-page Microsoft Word 5.0 document with a variety of fonts, sizes, and styles.

### Single Font

Print speed for a 20-page Word 5.0 document with double-space, 12-point Courier text in plain, bold, and italic.

### MacDraw Pro

Print speed for a complex drawing with few special effects, over 2000 simple objects, and several lines of Helvetica text.

### FreeHand 3.1

Print speed for a complex graphic with special PostScript effects. Illustration had non-linear blends and Bézier curves.

### PageMaker 4.2

Print speed for a 4-page newsletter with several fonts, a MacPaint image, and 3 gray-scale TIFF images.

### TrueType

Print speed for a 1-page Word 5.0 document containing 4 TrueType fonts in various sizes.

Apple Personal LaserWriter 320*	187	335	200	776	131	96
NEC Silentwriter 640	333**	230	350	1176	208	146
DEC DEClaser 1152	485	338	406	1264	258	202

\*With FinePrint and PhotoGrade off. \*\*Only 4 of 7 fonts required for our test were included. Some of the fonts were printed as bitmap fonts instead.

### BEHIND OUR TESTS

The printers were tested with a Macintosh IIci with System 7.1, 8MB of RAM, a Quantum LPS230 hard drive, AppleTalk on, and background printing off. The DEClaser printer was tested for comparison.

pack. For a street price of about \$800 you get a 300-dpi, 6-pages-per-minute laser printer with 3MB of RAM. It is 18 pounds and about the size of a Centris box.

Designed for the Mac, the Silentwriter delivers plug-and-play simplicity. It connects to one or more Macs through its AppleTalk interface. It took me only a few minutes to connect the printer and install the drivers and PostScript Printer Description files. The manual is also Mac-specific, so all the references are relevant. In this cross-platform world, that isn't always true.

The Silentwriter 640 comes with 17 resident Type 1 fonts and 35 downloadable TrueType fonts, as well as Type 1 and TrueType rasterizers. The built-in rasterizers speed performance by taking the burden of rasterizing fonts away from the computer. Also, the Silentwriter's

our test designed to measure performance in printing a fairly large (20-page), single-font Microsoft Word document, the 640 was faster than the 320 and the 1152. This speed increase is attributable mostly to the 640's faster engine, which, aided by NEC's Forward Memory Technology, increases throughput by processing a page while another page is printing.

Just as the NEC's speed is respectable but not blazing, its output quality is pleasing but not spectacular. The 640 uses NEC's proprietary Sharp Edge Technology (SET) for resolution enhancement, as well as Microfine toner for producing crisper blacks. NEC's SET resulted in crisp text and lines; even our complex Aldus FreeHand tests produced good-quality images. However, if you print many complex illustrations, you'll probably want a 600-dpi printer.

done right. Also, the heaviest stock the 640 accepts is 28-pound.

The 640 adheres to the EPA's Energy Star specification for power consumption. In standby mode, the 640 consumes less than 30 watts of power; however, it needs to warm up before you can print.

You can specify when the 640 powers down, through the printer's on-screen dialog box; the default is after idling 15 minutes, or you can specify 5- or 10-minute intervals. You can also instruct the printer not to use the power-saving mode.

With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, the NEC Silentwriter 640 deserves a spot on your shopping list. Just remember that this is a crowded category and the players and prices are changing all the time, so shop wisely.—DAN MUSE



# DOS Compatible Card

## PC Coprocessor Card

**PROS:** Inexpensive; runs faster than some stand-alone PCs. **CONS:** Works in only Centris 610 and Quadra 610; has no PC expansion or networking options. **COMPANY:** Apple Computer (408/ 996-1010). **COMPANY'S SUGGESTED PRICE:** \$399.



**M**AC PURISTS MAY HATE THE IDEA, but Apple has made it clear that compatibility with the PC universe is part of the new Apple. The DOS Compatible Card for Quadra/Centris 610, ungainly name aside, is proof that Apple means what it says. With this card, you can add a PC into the Processor Direct Slot (PDS) on a Centris or Quadra 610.

The card uses the Mac's video, drives, keyboard, and mouse; a control panel lets you switch between the PC and the Mac, or you can show both systems simultaneously if you have two monitors. The PC card comes with Microsoft DOS 6.2 but not Windows 3.1. This is the real thing—not emulation, like Insignia Solutions' SoftPC for 680X0 Macs or SoftWindows for Power Macs.

The card uses a 25MHz Intel 80486SX CPU (one with no math coprocessor), which is comparable in performance to the 25MHz 68LC040 used in a Centris 610. Macworld Lab tests show that the performance of Apple's PC card is about 16 percent faster than a typical 486SX-based PC from Zeos International that we tested, even though the Apple card can't take advantage of Windows optimizations, such as 32-bit disk

access. And it matched the performance of the Tandy 486SX PC we used as our basis for comparison. In fact, the PC card's performance matches that of a Quadra 610.

But in several ways, Apple has crippled the PC card. First, it doesn't work in Power Macs, so if you upgrade your 610 to a Power Mac 6100/60, you can't use the card. Second, there is no networking support, so you can't directly connect the PC to your office network, except for printing. (You have to connect the Mac to the network and then transfer files between the Mac and the PC card.) Third, it works in only the Centris and Quadra 610.

The PC card lets you connect to external PC SCSI drives—at least in theory. We found that, even using two of the most common PC SCSI cards (one from Adaptec and the other one from Future Domain), the Apple PC card read files unreliably, sometimes even causing file corruption. While PC SCSI is not as stable as Mac SCSI, we had this problem with only one PC (a Compaq 486SX) of the half dozen PCs we used the cards and drives with.

Apple bundles the DOS Compatible Card with a Quadra 610, but beware: this \$1579 Quadra 610 has no math coprocessor, unlike the regular Quadra 610. The bundled 610 also has too little RAM (8MB) and hard disk space (160MB) to run both System 7 and Windows comfortably, especially if you have multiple programs open in each environment. (You'll want 8MB on the PC card and 8MB on the Mac.) You're better off buying a regular Quadra 610 and the PC card separately.

There are a few bright spots. The new version (2.0) of Apple's Macintosh PC Exchange PC-disk-mounting software adds support for PC SCSI hard drives, so you can mount them on the Mac's desktop like a Mac drive. And the control panel that manages the PC card's settings is well designed. The PC card can use the Mac's memory, but only if there is no RAM in the card's SIMM slot.

If you want to integrate a PC into your Macintosh, the best option is to use



This Mac has Intel inside.

Orange Micro's OrangePC cards (see *Reviews*, October 1993), which are available in speeds from 25MHz 486SX to 100MHz IntelDX4, and which support external PC networks and expansion cards. The OrangePC cards are more expensive, but they offer more. Plus, they can be used in Power Macs (except the 6100/60).

All in all, the PC card is essentially limited to people who, say, use a Macintosh at work but need a PC at home for their kids' homework. Clearly, Apple needs to make a more convincing product to fulfill its commitment to working in a multiplatform environment.

—GALEN GRUMAN



## Which Windows Option Is Fastest?

### CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

■ Best result in test. Products are listed in decreasing order of overall performance.

66MHz 486DX2 (Gateway 2000 4DX2-66V)  
33MHz 486DX (AMI 486/33)  
25MHz 486SX (Tandy 3100 Model 10)  
Apple DOS Compatible Card (25MHz 486SX)  
Timbuktu Pro 1.0 controlling the AMI 486/33  
SoftPC 3.1 on Centris 650

#### Common

Average of results from standard business tasks.

#### Scientific

Average of results from standard business and scientific tasks.

### WINDOWS-PERFORMANCE INDEX

Times as fast as a 33MHz 486DX PC (486DX = 1.0).

#### Aldus Info Publisher 2.0

Find and replace, layout reformat, and file-format conversion.

#### Lotus Ami Pro 3.01

Report generation, file-format conversion, and data sort.

#### Lotus 1-2-3 4.01

Integer and floating-point calculation, file open, and scroll.

#### Microsoft Access 1.1

Source-database conversion and data sort.

	Common	Scientific	Aldus Info Publisher 2.0	Lotus Ami Pro 3.01	Lotus 1-2-3 4.01	Microsoft Access 1.1
66MHz 486DX2 (Gateway 2000 4DX2-66V)	23.0	62.1	1.6	1.7	1.4	1.3
33MHz 486DX (AMI 486/33)	15.5	36.3	1.0	1.0	1.0	1.0
25MHz 486SX (Tandy 3100 Model 10)	12.1	12.6	0.9	0.6	0.2	0.6
Apple DOS Compatible Card (25MHz 486SX)	11.9	12.7	0.6	0.7	0.2	0.6
Timbuktu Pro 1.0 controlling the AMI 486/33	11.0	31.1	0.7	0.5	0.3	0.7
SoftPC 3.1 on Centris 650	1.6	2.8	0.1	0.1	0.1	0.1

### BEHIND OUR TESTS

Macworld Lab tested three options for running Windows programs on Macs—Apple's PC coprocessor card on a Quadra 610, Insignia Solutions' SoftPC on a Centris 650, and Farallon Computing's Timbuktu Pro 1.0 remotely controlling a 33MHz 486DX-based PC from a Centris 610 over a LocalTalk network—against three business-level Windows PCs. All systems but the Apple PC card and SoftPC used moderately accelerated 8-bit color (because these two Mac products use just standard VGA, they run in 4-bit color).



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**Circle 149 on reader service card**



# Deck II 2.1

## Digital-Audio Recording Software

**PROS:** Records and plays up to eight simultaneous tracks on a Quadra 840AV (up to six on a 660AV); attractive, elegant interface; excellent automation, MIDI, and QuickTime support. **CONS:** No equalization features; copy-protected. **COMPANY:** OSC (415/252-0460). **LIST PRICE:** \$399.



WHEN APPLE INTRODUCED THE AV Macs last year, multimedia producers and musicians thrilled at the notion of recording and playing back CD-quality audio without paying a four-figure price for a board such as Digidesign's Audiomedia II.

OSC's Deck II lets an AV Mac strut its stuff. The original Deck was marketed by Digidesign and worked with that firm's sound hardware. Deck II is sold by OSC and works with the AV Macs as well as with several Digidesign cards; with RasterOps' MediaTime card; and with Spectral Innovations' NuMedia card, which uses the same AT&T 3210 digital signal processor (DSP) chip as the Quadra 660AV and 840AV.

Deck II turns a Macintosh into a multitrack digital-audio workstation that enables you to record, mix, modify, and play back CD-quality sound. Many of Deck II's windows mimic common recording tools: there's a Mixer window with sliders and volume meters for adjusting sound levels, and a Transport window with play, pause, record, rewind, and fast-forward buttons.

After you've recorded one track, you can add material to other tracks. For example, you can add background music to narration or turn yourself into a one-person barbershop quartet. When you've filled seven tracks on an 840AV, for instance, you can combine (or *bounce*) them onto the eighth track, thereby freeing the original seven for still more overdubs. You can do all this with a multitrack tape deck, of course, but sound quality suffers when you bounce tracks on analog tape decks. Not so in the digital world, where you can bounce until you run out of disk space without compromising sound quality.

Deck II can record at either of two sampling rates—44.1kHz (the standard compact disc rate) or 48kHz (used by some digital audiotape decks)—with 16 bits of resolution. You can convert a track

or combination of tracks to 11kHz or 22kHz with 8 bits of resolution; you might do this when exporting a finished recording you'll use in a program such as HyperCard, Adobe Premiere, or Macromedia Director.

Deck II provides all the goodies you would find in a high-end digital-audio recorder. A punch-in-punch-out feature lets you rerecord portions of a track by switching into and out of record mode at specified times. You can create audio bookmarks to quickly jump to specific sections of a recording. And you can *scrub* a recording—slowly play it forward or backward to locate an exact point, such as the start of a sentence.

With Deck II's Mixer window, you can pan recorded sounds to make them come from the left channel, the right channel, or anywhere in between. You can even pan during playback to make a sound whoosh across the stereo field. You can adjust the playback levels of each track—to boost the background music during a pause in the narration, for example. And you can record your panning and volume adjustments so that they repeat each time you play the recording. None of these

adjustments alter the original recording—this technique is called *nondestructive* editing—so you can punch in multiple takes and create as many mixes as you like.

Deck II also provides several *destructive* editing features that adjust volume levels and fade tracks. But the program can't edit sound at the waveform level; you can't, for instance, remove a sneeze in a narration. For jobs like this, you'll need a waveform editor such as Digidesign's Sound Designer II (which at this writing works only with Digidesign's hardware).

Deck II provides no equalization (EQ) features, which would let you boost or attenuate certain frequencies to improve a recording's tonal qualities. A forthcoming multitrack digital-audio program, Alaska Software's DigiTrax (408/738-3320), offers EQ and supports up to six simultaneous tracks, but the prelease version I examined lacked Deck II's extensive automation capabilities.

Deck II offers excellent support for MIDI sequences and devices. You can import MIDI files so that Deck II plays them back while you record audio tracks—great for combining vocals with a MIDI sequence.

Deck II is also a superb tool for working with QuickTime movie sound tracks. You can import sound tracks from QuickTime movies and export Deck II recordings as QuickTime sound tracks. You can use these features, say, to import a QuickTime movie of an interview, add a musical background, and then replace the movie's original sound track with the combination of the music and narration. Deck II can also display live video from a camcorder or VCR connected to an AV Mac's video-input jack.



**Deck II's Digital Studio** Deck II's Mixer window lets you adjust volume and panning. The Transport window (bottom right) allows you to navigate within a recording; note the markers for quickly jumping to specific points. With the track window (lower left, behind the others), you can bounce, arrange, and otherwise manipulate tracks.

I found Deck II to be more robust than most digital-audio programs, many of which require you to disable all but the essential extensions and can be unreliable if you don't. Deck II coexists happily with other programs—indeed, as I'm writing this in Microsoft Word, Deck II is playing eight tracks of audio in the background.

Deck II uses a relatively unobtrusive form of copy protection. You can install the program on up to two hard drives by "authorizing" the drives with the installation program. (If you simply copy Deck II's icon to your hard drive, the program will ask you to insert the master floppy each time you start it.) Unlike some early authorizing schemes, Deck II's system is not affected by disk-defragmenting programs.

OSC's Deck II is a dream come true for AV Macintosh users. It is able to handle nearly any audio task you can throw at it (the exceptions being waveform editing and equalization), and it's the best tool available for doing QuickTime audio postproduction work. Seeing this program running alongside the likes of Word and Excel illustrates just how wonderfully versatile the AV machines are.

—JIM HEID



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# WriteNow 4.0.1

## Word Processor

**PROS:** Fast and small with intuitive interface; elegant new table capabilities; graphics now easily imported, sized, and cropped; Merge Helper facilitates creation of merge documents. **CONS:** Tables limited to single page; fonts in EPS graphics aren't downloaded to printer; difficult to reach technical-support staff. **COMPANY:** WordStar International (415/382-8000). **LIST PRICE:** \$119.95.



**W**RITENOW HAS LONG HAD ITS enthusiastic supporters. The tidy word processor boasts speed, modest memory requirements, strict WYSIWYG display of pages, and a relatively uncomplicated interface. But a few missing features—the ability to insert and customize tables and to easily import, size, and crop graphics files, chief among them—have kept WriteNow out of the big leagues. With this release, both longtime users and those interested in switching to a more memory-efficient word processor are in luck.

Tables are the splashiest new feature. Creating a table is easy. You choose Insert Table from the Format menu, and a dialog box displaying eight predefined table types appears. Choose a style, enter the number of rows and columns you need, and voilà, the table appears in your current document at the point you last left your cursor. A narrow, vertical Table Tool palette makes it easy to add or delete rows or columns; divide or merge adjacent cells; and define single-, bold-, or double-line borders.

Additionally, creating a table from imported tab-data couldn't be easier. You simply import the file in tab-delimited format, select the appropriate range of data, and then choose Text to Table from the Format menu.

The new table features are well designed. Cells expand to accommodate text or graphics. Selections are limited to rectangular arrays of cells, but the process is straightforward: hold down the shift key and click on the first and last cells in your selection; you can also click and drag to select cells.

Formatting is a cinch. An inserted table automatically expands to fit within the margins of the document. To change individual column, row, and cell widths, you select an array of cells and drag a corner or an edge to the desired position.

Customizing font display is as easy as changing or creating Table Styles. And you can use WriteNow's expanded palette of 88 colors to enliven table fonts, borders, and cell backgrounds.

The biggest drawback to WriteNow's implementation of tables is that they can be no larger than a single page. You can't split a table across pages without physically creating another table. This option is most inconvenient if you need to change styles and layout midstream. The fact that WriteNow can import Microsoft Word tables is wonderful—unless the table is larger than a page, of course. In this case, you simply lose any data beyond the first page.

WriteNow 4.0.1 offers improved handling of graphics. Besides importing EPS, PICT, and MacPaint graphics, you can now size, crop, and reposition them for better display within a document. Once again, though, graphics files are constrained to the size of your page.

One serious problem with the handling of EPS files is that PostScript fonts included in a file are not downloaded and so do not print correctly. Sophisticated users may think to include an invisible character in each needed font in a text line preceding the graphic; this ensures that the font is downloaded, but it's an awkward workaround.

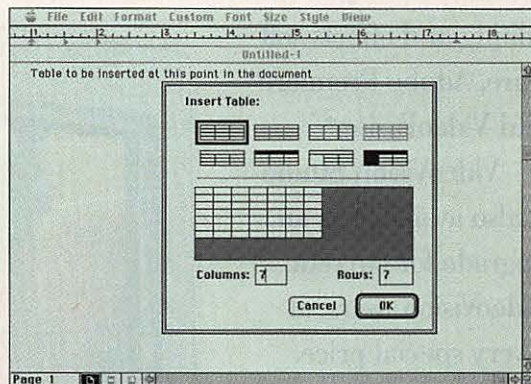
The new version greatly simplifies the creation of merge documents. You first generate a data document that lists the fields you want to include in your template document. Then, while you're working on the template document, the Merge Helper window offers two pop-up menus. The first lists merge commands (IF, IF ELSE, ASK, and NEXT, for instance). To generate the list in the second pop-up menu, WriteNow scans your data document and offers field choices. When you choose options from Merge Helper menus, WriteNow inserts them into the template document with the appropriate cue markers.

PowerBook users will find several useful new features. A memory-optimization scheme reduces the number of times WriteNow must go to the hard disk. A Battery Indicator extension keeps you posted on the status of your battery. And perhaps most important for those using passive matrix screens, the Large

Text Cursor option fattens the often-hard-to-find I-beam.

Those who upgraded early to version 4.0 faced several bugs. WriteNow icons, both application and document, sometimes switched to generic icons. Lines of type flickered in a most annoying manner. Using the WriteNow-to-RTF filter sometimes caused crashes. And users employing system enablers such as Connectix Mode 32 had printing problems. Version 4.0.1 neatly wipes out the bugs. Plus, it adds the ability to save 4.0 documents in version 2.2 format, a necessary workaround for QuarkXPress users.

There are still a few features that users may be pointing to on their wish lists. WriteNow includes no outlining, glossary, or annotation capabilities. To create outlines, you must tediously apply the Move Margin Right (or Left) to Tab commands. Many users may want a separate user dictionary. Some formatting



**Easy Tables** After choosing Insert Table from the Format menu, you pick one of eight table styles. To determine the number of columns and rows in the table, either enter numbers into the appropriate boxes or click in the gray display area next to the table to add rows or columns.

niceties, such as keeping lines together on a page or defining spaces before and after paragraphs, are still missing. A feature that would allow users to move text using a simple drag-and-drop option would be a blessing. And some users would like the option, say, when scrolling, to forgo the strict WYSIWYG display that shows headers and footers for each page. Finally, the sale of WriteNow to giant WordStar International means that users often wait endlessly for someone to answer the technical-support lines.

Still, WriteNow is more than adequate for many word processing needs; and as more and more users find themselves hauling around laptops, WriteNow's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will continue to win it enthusiastic fans.

—SUZANNE STEFANAC



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# ClarisImpact 1.0

## Business Graphics Software

**PROS:** Wonderful integration of text and graphics; useful graphing and charting models.

**CONS:** Presentation function lacks thumbnail slide sorter. **COMPANY:** Claris Corporation (408/727-8227). **LIST PRICE:** \$399.



OVER THE YEARS, INTEGRATED software has been the subject of so much marketing hype that it's easy to lose sight of its real potential. But when you think about it, the concept of consolidating applications to address a common purpose is a wonderful idea. And that's the key to ClarisImpact, a product designed to facilitate organizing and communicating information.

ClarisImpact integrates business graphing, project management, object-oriented drawing, word processing, and presentation functions. It lets you organize and illustrate data with a variety of charts and graphs, add graphical embellishments, incorporate textual descriptions, and disseminate the finished product as a paper-based report and visual presentation.

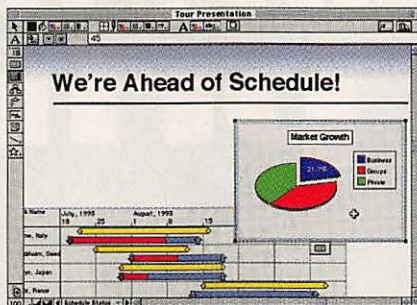
ClarisImpact blends its components into an exceptionally versatile graphics-production environment that is significantly more approachable and far more comprehensible than is juggling a similar collection of dedicated programs. So you don't have to be a graphics professional to master ClarisImpact quickly.

ClarisImpact lets you produce three document types. Report documents, which you produce in a word processing-style window, emphasize textual information and are appropriate for projects that require paginated output, such

as business plans, annual reports, and newsletter articles.

You build draw documents in a MacDraw-like work space where it's possible to position graphic objects and text elements with precision. Draw documents are especially suited to projects that can grow beyond single-page boundaries, such as organization charts and project time lines.

Presentation documents are collections of sequential images built on a template or master slide. Naturally, these



**Editable Models** Even within a finished presentation, ClarisImpact's graphics models remain active and editable.

documents are intended for producing slides, overheads, and computer-driven productions. However, ClarisImpact provides the same tool palette and attributes bar regardless of document type, so you can always do the same kind of graphics and text work.

From the tool palette, you select the graphic models—organization charts, flowcharts, time lines (Gantt charts), calendars, outlines, data tables, and data graphs—that are the core of ClarisImpact. Select a model and drag out a frame in the document window, and that graphic model is available for immediate use. For example, when you choose an organization chart model, you can enter information in the formatted boxes of a basic hierarchy and, by pushing buttons on the model, alter and expand the organizational structure as necessary. Menus and tool bars, which contain the particular functions pertaining to each graphic model, toggle on or off as you select models.

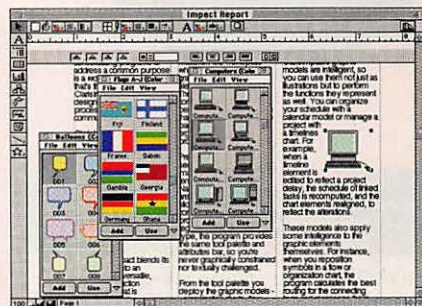
ClarisImpact's graphic models are intelligent, so you can use them as more than illustrations. You can organize your schedule with a calendar model or manage a project with a time-line chart. For example, when you edit a time-line element to reflect a project delay, ClarisImpact recomputes the schedule of linked

tasks and realigns the chart elements to reflect the alterations.

These models also apply some intelligence to the graphic elements themselves. For instance, when you reposition symbols in a flowchart, the program calculates the best routing for the connecting lines and automatically rearranges them. In addition, you can edit data graphs bidirectionally—change the data in the table, and the graph adjusts to match; reconfigure the graph, and the data updates automatically.

Overall, ClarisImpact's collection of charting and graphing models covers the business-graphics requirements of most users. Although they won't supplant dedicated programs, the individual models offer more than sufficient functionality. Many users will never need more.

An extensive implementation of styles makes it easy to customize graphs and charts. Similar to the styles functions found in word processors, ClarisImpact's styles control every attribute that can be applied to a model, such as the type of graph, text size and font, colors and fill patterns applied to elements, and overall layout of the model. You can define, save, and apply styles either globally or to individual model elements. A filtering function lets you apply a subset of a style. The program comes with an extensive collection of styles ready for use or customization, and these canned styles share familiar characteristics, making it easy to

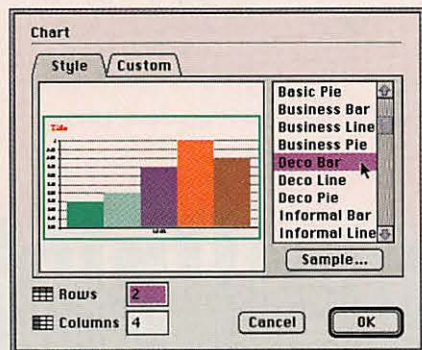


**Drag, Drop, Wrap** Libraries of drag-and-drop images and automatic text-wrap make combining text and graphic objects a snap.

change from one layout to another or to combine several model types that share a graphic look.

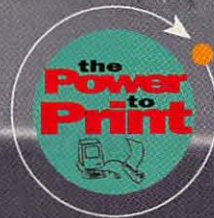
Drawing tools can be torn off the tool palette for use with any ClarisImpact document. For the most part, they are fairly basic. Notable, however, are the Bezigon tool, which draws Bézier-curve shapes, and the Note tool, which produces editable Post-it-style notes you can attach anywhere on a document. In addition, a second tear-off palette holds 16 shapes, including polygons, stars, and arrows.

*continues*

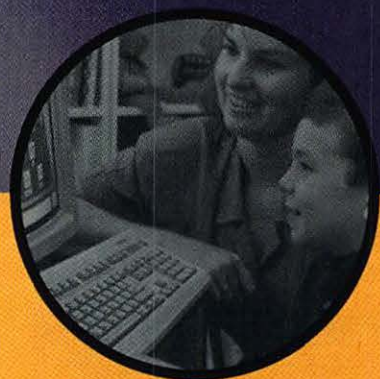


**Stylishly Appointed** ClarisImpact offers a large selection of ready-to-use styles to give graphs and charts a coherent look.





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ClarisImpact's graphics libraries are accessible from floating palettes containing individual thumbnail images, which you can drag and drop. You can add graphics to existing libraries and create your own libraries. Library graphics traveling to the page pass through the Clipboard rather than a separate channel, so you must be careful not to overwrite the Clipboard's contents. Still, the library interface is well implemented, and the program comes with more than 3000 clip art objects.

Text handling is generally fine. When building report documents, ClarisImpact behaves like a well-appointed word processor that includes such page-layout features as columnar formatting, text wrap around graphic objects, and footnoting. Similar text-handling features are available in text-object frames created with the text tool in draw and presentation documents. You can link these frames to flow text over several locations.

You can also use text frames within report documents, as you might with a caption inside a balloon graphic object. But more complex juxtapositions, such as flowing text over linked frames inside that balloon—admittedly an uncommon situation—can confuse the program as to where the text goes. Still, ClarisImpact's integration of text and graphics is usually excellent.

ClarisImpact supports QuickTime, so you can include video clips in computer-generated presentations. However, the program should offer the ability to visually sort through a presentation using thumbnails. The name-oriented slide manager is flexible enough, but it requires that you christen each slide with a distinctive name and retain a mental picture of its content—not a problem with a half-dozen slides but cumbersome if you're producing a gross.

Program documentation is well organized, readable, and thorough. Novice users should have no difficulties getting started. And ClarisImpact runs even on a Mac Plus with 2MB of RAM. Mindful of such minimalist users, Claris has included a good selection of monochrome styles and clip art libraries.

Taken individually, ClarisImpact's components naturally suffer in comparison with dedicated programs. But the program's outstanding integration offers versatility that dedicated programs are pressed to match. And the components mesh so well that each enhances its companions, much as the members of a well-drilled basketball squad do. By emphasizing teamwork, ClarisImpact realizes the potential of software integration.

—CARLOS DOMINGO MARTINEZ

## Typestry 2.0

### 3-D Renderer for Type

**PROS:** Superb rendering; many new features; good QuickTime support; good documentation. **CONS:** Can't access a font's stylistic variants if the screen font isn't installed; no canned positioning effects. **COMPANY:** Pixar (510/236-4000). **LIST PRICE:** \$299.



**P**IXAR TYPESTRY'S APPROACHABLE interface, animation support, and outstanding RenderMan rendering technology have made it a popular choice among graphic designers and QuickTime movie producers needing to create 3-D text effects.

Typestry 2.0 improves on the original version's straightforward operating style and adds some significant new features. Typestry 2.0 can import images in Adobe Illustrator 3.0 (and later) format,

menu. Typestry's biggest limitation—one that I pointed out when I reviewed version 1.0—is that you can't access stylistic variants of a font (italic, bold, bold italic) unless you've installed the screen fonts for those variants. Most PostScript Type 1 fonts include screen fonts for style variants, but TrueType fonts don't, so you're limited to using the plain style of a TrueType font.

You can bevel type characters to produce a rounded, routed-out, or sharp-edged appearance, and you can now create and save custom bevel shapes. You can also now customize Typestry's looks—its library of dozens of surface properties such as chrome, bricks, and stucco. (Pixar One Twenty Eight, a CD-ROM containing 128 additional textures, is available for \$299 list price.)

Typestry's already excellent lighting features—nine front lights and nine back lights—are largely unchanged in version 2.0, except for the inclusion of a new light that adds reflections to shiny objects. It's easy to experiment with coloring and repositioning lights and with adding gels,

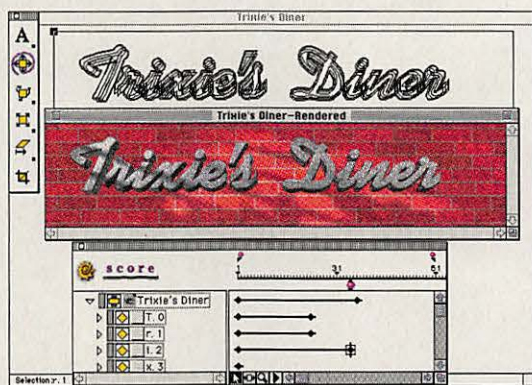
to cast shadows that simulate venetian blinds, spotlights, windowpanes, and more. Residents of London and Los Angeles will be glad to know that Typestry's electronic atmosphere now includes fog and haze effects.

Typestry 2.0's animation features, on the other hand, are greatly improved. You still alternate between moving objects and creating keyframes, letting the program tween the required intermediate frames. But the new Score window provides better control over keyframes and makes it easier to ungroup text objects so that characters move individually.

The new, full-color manual—loaded with step-by-step instructions, practical tips, and a detailed index—is a vast improvement over Typestry 1.0's friendly and informative but poorly organized and unindexed manual.

Typestry 2.0 requires roughly 5.3MB of free memory, but 10MB or more is better; an 8MB Mac can easily run out of memory when rendering an image at highest quality settings. Still, in my tests the program was rock-solid, even when I switched between other applications while rendering in the background. If you want to create 3-D text for a page layout, a multimedia production, or a QuickTime movie, you want Typestry 2.0.

—JIM HEID



**Typestry 2.0** To rotate and manipulate objects, you operate on them in the wire-frame view (top), and the rendered image appears below. (My Quadra 840AV rendered this one in about 12 minutes.) The Score window (bottom) controls animation and object grouping.

enabling you to add 3-D effects to logos and the like. New object-building options let you place letters on tube shapes and on "rubber sheets," which bend and flutter in a variable digital wind. Typestry's animation capabilities let you animate flags that flutter, distorting their text as they wave. The new particle system simulates everything from fireworks to bubbles to falling snowflakes.

Like its predecessor, Typestry 2.0 opens with an untitled window and a tool palette for creating new text objects and for moving, rotating, and resizing them. Creating a text object involves clicking on the text tool to display the text dialog box, which lets you specify the depth of the text and choose a font from a pop-up



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Release Two	Virtus WalkThrough
Insignia Solutions	Wolfram Research
SoftWindows	Mathematica
Language Engineering	WordPerfect 3.0
LogoVista E to J	WordPerfect Office
Leaf Systems	
Lotus cc:Mail	

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From left, the Power Macintosh 8100/80, Power Macintosh 7100/66 and Power Macintosh 6100/60.



\*Effective 3/14/94, Apple Price is for the Power Macintosh 6100/60 with 8MB of memory and a 160MB hard drive. For the sake of custom configuration, keyboard, monitor and mouse are sold separately. Unless bundled with a particular configuration, SoftWindows must be purchased separately. Performer 600. There are two ways to upgrade: The Power Macintosh Upgrade Card (Apple Price from \$699) or a complete logic board swap (Apple Price from \$999). Not every model offers both upgrade options. ©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh, Macintosh Business Machines Corporation, used under license therefrom. SoftWindows is a trademark of Insignia Solutions Inc.



# Resampling Stats 1.0

## Statistics/Probability Software

**PROS:** Innovative, easy-to-understand statistics program; efficient programming language. **CONS:** Needs more graphics features. **COMPANY:** Resampling Stats, Inc. (703/522-2713). **LIST PRICE:** \$225.



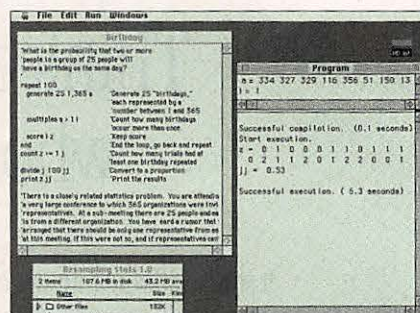
**R**ESAMPLING STATISTICS (ALSO known in the physical sciences as the bootstrap method) is a revolutionary technique in a field that's overdue for a revolution. Many students dread taking the required statistics course. In many cases, the course starts out mildly confusing and ends up thoroughly baffling, leaving students with a repertoire of complex techniques that they often misapply.

Dr. Julian Simon, a rather controversial economist (he annoyed many environmentalist colleagues by correctly predicting that the world would in fact *not* run out of mineral resources by the early 1990s), suggested in the 1970s that computers offer a way to calculate quantities in statistics directly. Rather than produce statistics by calculating standard analytical formulas, he

devised a simple simulation language that treats questions in probability and statistics as experiments.

An example of this is the solution of the notorious birthday problem. The question is, How many people do you have to poll, on average, before you find two that have the same birthday? There's a formula for computing cases such as this, but the resampling method is formula-free. The computer makes up random birthdays in a set, and records the number of trials it took to produce a match. Have the computer do this 1000 times or so, average the number of trials, and that's your answer.

In principle, any problem treated by traditional statistical methods can be treated by a resampling approach, and resampling has a conceptual advantage in that it makes no a priori assumptions about underlying distributions of the quantities involved. Resampling Stats provides a compact, BASIC-like language for programming—most problems, including the resampling versions of ANOVA and hypothesis testing, can be solved with fewer than a dozen lines of code. The program includes a tutorial and a large assortment of samples, and you can modify the samples to fit your own statistical problems.



**Happy Birthday** Resampling Stats calculates the chances of a repeat birthday in a group of 25 people. The same code can be modified to answer a variety of probability questions.

Resampling Stats needs to provide histograms for distributions,  $x$ - $y$  plots, and a little more discussion of resampling methods for the  $x$ - $y$  data sets classically treated by regression analysis. Since college statistics texts haven't quite caught up with developments in resampling, the manual should offer more detailed analysis of first-year statistics topics in resampling terms. Nonetheless, Resampling Stats is powerful, easy to use, easy to understand, and has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration.—CHARLES SEITER

# SerePlot 2.12

## Scriptable Plotting Software

**PROS:** Automates batch processing of data; good set of math tools; examples of scripting cover common applications. **CONS:** Limited graphing types; a few glitches. **COMPANY:** Scientific Visions (301/593-0317). **LIST PRICE:** \$135.



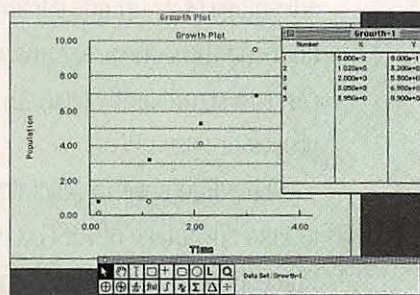
**S**EREPLLOT IS A UNIQUE MACINTOSH charting and graphing program. It offers only the plainest two-dimensional line charts; its strength lies in its AppleScript support. For example, you can automatically load and analyze three months of stock-market data on 1000 stocks—looking for signs of statistical trends—and then print charts only for stocks that meet your preassigned criteria. In the scientific realm, you can, for example, have SerePlot sift through files of near-infrared spectra of compounds looking for maxima and minima at selected points. If you have any kind of data that can be visualized in a 2-D plot, SerePlot has the machinery to crunch it.

SerePlot's plotting facility is easy to use and lightning fast. SerePlot wants you to

keep your data in tables (the choices are  $X$ - $Y$ ,  $X$ - $Y$ - $DY$ , and  $X$ - $Y$ - $DX$ - $DY$ ) and provides plenty of help (including sample Microsoft Excel file-conversion scripts) for getting data into Excel. The main plot dialog box shows which data tables are open, and an Objects menu specifies plot data elements. You can alter plot axes, labels, and titles, but SerePlot features such intelligent defaults and autoscaling that routine work may only need its built-in choices.

The Tool window is your introduction to SerePlot's math capabilities. Besides tools for locating  $X$ - $Y$  values on your plot, this window includes a derivative tool, an integral tool, a minimax tool, and a special tool that gives statistics (mean, standard deviation) on the data between selected  $x$ -axis points. You can cut data from a graph and paste it into a table, and you can define your own functions using an extensive list of built-ins, ranging from the usual trig/transcendentals to error and Bessel functions. The Math menu features calculus (it generates tables of numerical derivatives and integrals), binning, smoothing, interpolating, curve fitting to arbitrary functions, and fast Fourier transforms. SerePlot performs math functions impressively fast—an order of magnitude faster than analogous functions in Excel.

And AppleScript-based batch processing is SerePlot's glory. SerePlot uses the



**Pretty, Basic** SerePlot's main application is repetitive generation of simple plots, with automated analysis provided by AppleScript support.

Userland Frontier dialect and includes scripts for likely chores such as importing data or specifying plot parameters. You can learn to do something useful in an hour just by studying the examples provided. Support for SerePlot exists mostly on BBSS.

Version 2.12 contains an undocumented curve-fitting feature in the Tool window and doesn't implement the documented QuickFit version of curve fitting, but the company says that these glitches will be corrected by the time you read this.

SerePlot is quick, intuitive, includes a good tutorial, and is modestly priced. If you have piles of data and don't need animated, exploding bar charts in 24-bit color, SerePlot should be part of your analysis tool kit.—CHARLES SEITER



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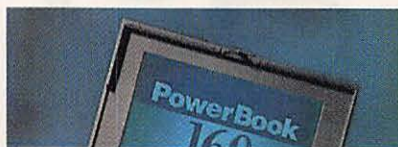


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# TrafficWatch II 2.0

## AppleTalk Traffic Monitor

**PROS:** Supports both LocalTalk and Ethernet; Excel macro for data analysis. **CONS:** Expensive; weak support for non-AppleTalk protocols; no print capability; no alarms or triggers. **COMPANY:** Neon Software (510/283-9771). **LIST PRICE:** \$495.



AS MAC NETWORKS MOVE FROM poky LocalTalk to sprightly Ethernet, network managers find themselves needing new monitoring tools. Neon Software's TrafficWatch II provides a host of network-monitoring capabilities for both LocalTalk and Ethernet networks, letting you get your feet wet in sophisticated monitoring even if Ethernet is still in your future.

TrafficWatch II is a single, self-contained application that comes with a Microsoft Excel macro for analyzing and printing captured statistics. The well-written manual includes useful network-measurement and tuning tips. Neon claims that this program supports all AppleTalk protocols, plus TCP/IP, NetWare, XNS, DECnet, and LAT.

For LocalTalk analysis, TrafficWatch II runs on any Mac with System 6.0.4 or later. Because it collects only statistics rather than all network traffic, the program requires only 1.5MB of memory. Of course, for Ethernet watching, you need an Ethernet adapter or a Mac with built-in Ethernet. TrafficWatch II supports all available Ethernet hardware.

Like most network monitors, TrafficWatch II runs only on a dedicated Macintosh; the program automatically disables AppleTalk when monitoring starts and reenables it when done. At launch, TrafficWatch II scans your network and displays a list of active AppleTalk devices and zones. You then call up bar-graph displays showing network use, traffic statistics for individual nodes and protocols, and error summaries. Some graphs let you click or option-click on an individual bar to see precise values. You can configure filters for specific nodes or protocols, and you can sort statistics by any one measurement.

You can automatically save snapshots to disk at user-defined intervals and then

analyze the saved statistics with the supplied Excel macro. You can also use the Excel macro to print various canned bar graphs and pie charts summarizing one or more snapshots.

Unfortunately, TrafficWatch II omits some features essential to real-world network management. Although the product claims to support numerous non-AppleTalk protocols, its actual capabilities are spotty. It groups non-AppleTalk traffic into broad categories, with no details on individual protocols such as FTP or Telnet. And it doesn't recognize non-AppleTalk devices—such as PCs or Unix systems—even though it summarizes traffic generated by those devices. You can't set triggers to start monitoring on a certain event, nor can you set alarms to alert you to problem conditions.

Finally, TrafficWatch II has got to be the first Macintosh application to produce so much output yet provide no printing facilities. It has no print command; Neon expects you to use the Excel

Device List								
Total Nets:		1	Total Services:		12	Total Nodes:	4	
Total Zones:		1	Total Types:		8	Resp. Nodes:	1	
R	Net	Node	Skt	Name	Type	Zone		
	0.1.4			Geko	Workstation	*		
	0.1.252			Spoko	Snap Mail	*		
✓	0.1.253			Geko	Macintosh Q			
	0.22.4			HelCentris	Workstation			
	0.22.252			HelCentris	RFPServer			
✓	0.22.253			HelCentris	Macintosh Ce			
	0.50.4			Hel's PowerBook 140	Workstation			
	0.50.245			Hel's PowerBook 140	RFPServer			
	0.50.247			Hel's PowerBook 140	MailServer			
	0.50.252			Spoko	Snap Mail			
✓	0.50.253			Hel's PowerBook 140	PowerBook 14			
	0.254.132			HP LaserJet 4ML	LaserWriter			
Total Packets:						41794	Total Errors:	28
Data Packets:						13765	Total Boasts:	0
Control Packets:						28029	Pkts Filtered:	0

Total Errors: 28

Device

Geko 0.1

Hel's PowerB... 0.50

HP LaserJet... 0.254

**Hot Charts** TrafficWatch II displays network traffic statistics through interactive bar charts; clicking or option-clicking on an individual chart item displays additional data.

macro to print the saved snapshot files. Worse, the manual does not document the format of these files (Neon says that such information is not available), so you're stuck with the supplied reports. Unless you are actually watching the screen when network overloads, error bursts, or similar problems occur, you must manually wade through Excel printouts to find trouble spots.

If TrafficWatch II were priced under \$100, these limitations might be acceptable. But its \$495 price is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. The purpose of a multiprotocol network monitor is to automate the chores of day-to-day network management. Without printing, alarms, triggers, or true multiprotocol support, TrafficWatch II misses the mark.—MEL BECKMAN

# VIP BASIC 1.0.1

## Programming Language

**PROS:** Great toolbox access; introduces object handling to BASIC; fast interpreter. **CONS:** No easy way to compile programs. **COMPANY:** Mainstay (805/484-9400). **LIST PRICE:** \$295.



BASIC HAS SURVIVED MAINLY BECAUSE it's significantly easier to learn than other languages. For the Mac, Microsoft offers QuickBASIC, and another product with a loyal developer following is Zedcor's FutureBASIC (see *Reviews*, *Macworld*, July 1993). Mainstay is now offering an applications-creation environment for BASIC that has the same scope as its highly regarded VIP C.

Like VIP C, VIP BASIC (VIP stands for visual interactive programming) uses a skeleton application called Dispatcher. VIP Dispatcher creates an event loop, which is the heart of every Mac program, and provides a simple structure to scan for and respond to Mac keyboard and mouse events. As in VIP C, you can add the actual application code to this structure in browserlike windows containing source code, variables, constants, and macros. There are essentially two ways to use VIP BASIC to speed up coding. First, you can familiarize yourself with the VIP programming-icon set and then string together icons for a flowchart version of your code that VIP BASIC translates into source code. The second way is to browse for toolbox routines and commands, and cut and paste together your own source code. Both of these approaches reduce the number of small errors that always seem to occur when you type page after page of code.

The other features of the VIP environment are also quite creditable. The interpreter is fast, which means that the run-time module is a workable method of distributing small programs. (The run-time module itself takes a bit more than 200K, and VIP BASIC programs usually require some trimming with the included PackMover utility.) The debugger, identical to VIP C's, is adequate—since VIP BASIC is interpreted, not compiled, the debugging requirements are less stringent. Mainstay includes examples for menus and dialog boxes and provides subprograms that let you program one level up from toolbox calls. The documentation and tutorial are the best available for a Mac BASIC product. Finally, an

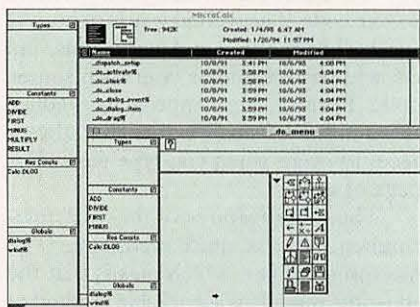
*continues*



Apple-events link to Symantec's Think Reference provides instant Mac-feature documentation (assuming you have a copy of Think Reference).

Two key points, however, make this product less valuable than VIP C. The source code generated in VIP C can be compiled without much modification either by the Think C or MPW C compiler. There's no corresponding compilation route in BASIC. If you use a minimal set of BASIC keywords, you can export a VIP BASIC project to QuickBASIC and compile the code, but it isn't easy to do an impressive application using this method. I had no success in compiling VIP BASIC projects under FutureBASIC—a disappointing result, since FutureBASIC produces smaller, faster compiled code than QuickBASIC.

The other drawback has to do with the wisdom of using BASIC for large-scale Mac programming. In the VIP approach, BASIC is treated as an alternative to C—throughout large patches of VIP BASIC documentation, C keywords have simply been replaced with BASIC keywords, and the sample programs are equivalent in both products. Given that most of the code in a typical Mac program deals with interface management rather than computation, BASIC programmers should just bite the bullet, learn a minimal version of C, and work in VIP C with a view toward compiling programs easily. If you insist on using BASIC, the combination of FutureBASIC and Staz Software's PG:PRO is simpler to use and produces respectable compiled code.



**BASIC through Pictures** You can program in text or by linking icons from the palette. In any window you can switch back and forth between text and a flowchart view based on the icons.

Nonetheless, VIP BASIC is a popular product because it lets programmers who know only BASIC get started producing real, if interpreted, Mac programs. If your background is in BASIC and you want to learn the Mac Toolbox, VIP BASIC is an excellent choice; as a serious developer's tool, it's not on the same footing, despite its considerable virtues, as Mainstay's VIP C.—CHARLES SEITER

## Managing Your Money 6.0

### Personal-Finance Program

**PROS:** Good tax-planning and investment features. **CONS:** Data entry can be a chore; technical support is hard to reach. **COMPANY:** Meca Software (800/820-7457). **LIST PRICE:** \$79.95.



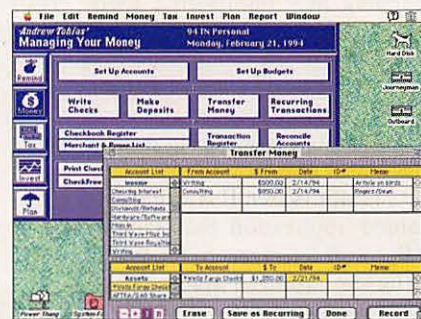
**M**ECA SOFTWARE'S MANAGING YOUR Money (MYM) 6.0 is a good program for managing your personal finances, but overall it fails to topple the market leader, Intuit's Quicken 4.0. People who need extensive tax-planning and investment-tracking features should give MYM serious consideration, however. New to version 6.0 are updates for the 1993 tax code, new printed-check formats, financial-report customization features, and security-price updates via CompuServe.

Ease of data entry is important with financial programs, and MYM comes up short. On the plus side, when you choose one of the five tools—Remind, Money, Tax, Invest, and Plan—MYM's navigation palette, a flowchartlike diagram shows the tool's functions. But, unlike Quicken and Survivor Software's MacMoney, MYM doesn't let you enter all of your transactions on one screen. Within the Money tool, there are separate screens for writing checks, making deposits, and transferring money. You enter a check in the Write Checks screen by using the mouse to select from a pop-up menu the account from which you're drawing funds, then type in the information about payee and expense categories. (Having to take your hands off the keyboard gets quite annoying.) To enter an ATM withdrawal (which other programs handle as if it were a check), you use the Transfer Money screen to specify the account the money is coming from (for example, a checking account) and the expense category on which you spent the money.

Another frustrating thing about MYM is that you must remember to use different screens for different cases of the same transaction type. The Make Deposits screen can handle only one income category per deposit, so if you make deposits that you want to allocate to different income sources, you have to use the Transfer Money screen.

MYM really stands out in its depth of tax-planning and investment features, however. You're encouraged (but not required) to assign each expense category

to a tax category corresponding to the IRS's 1040 form or schedules A through F. Using the Tax tool, you can then estimate your tax liability at any time and print out reports of your tax position or perform "what-if" analyses. It exports data in TXF format to Meca's companion tax program, Andrew Tobias' TaxCut, or to Chipsoft's MacInTax, and it handles investments exhaustively through the Invest tool, which lets you track stocks and bonds, options, mutual funds, and other securities. MYM handles financial portfolios linked to cash-management accounts, and it tracks IRA positions.



**Navigation and Entry** Selecting the money tool from MYM's navigation screen yields the Transfer Money screen for tracking a deposit with multiple income sources.

But MYM needs better technical support. Over the course of this review, I made many (toll) calls, and all I got were busy signals; I never did get through to Meca's support. Sending a fax with my questions provided a slightly better response: I sent the fax on a Wednesday and got an accurate faxed reply the following Monday. The best support response came when I posted questions on Meca's CompuServe support forum; I received overnight replies that were complete and concise. Meca does offer a support plan (\$49.95 per year) that provides access to priority support lines with extended hours, a free annual upgrade of MYM, and other benefits; but Meca clearly needs to improve the level of its free support.

Managing Your Money 6.0 does a good if somewhat roundabout job of tracking your total financial picture. MYM isn't as easy to use as Quicken or MacMoney, but it excels in tax, investment, and financial planning, with features that beat any of the competition. If these areas are important to you, then MYM is your best bet. But if you just need an electronic checkbook, you might be more satisfied with another program.

—TOM NEGRINO



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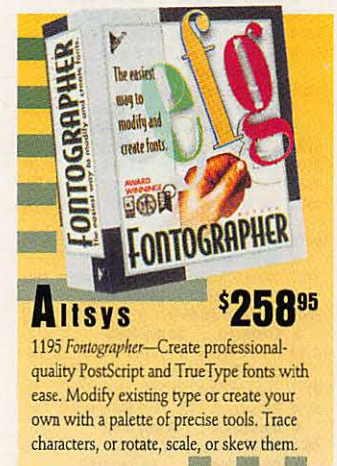
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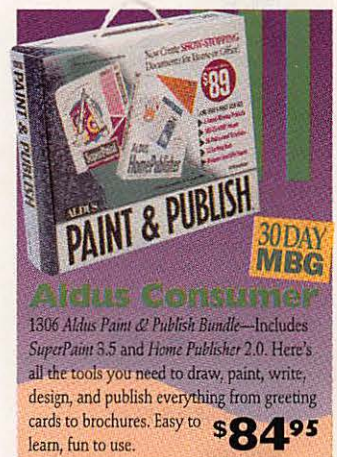
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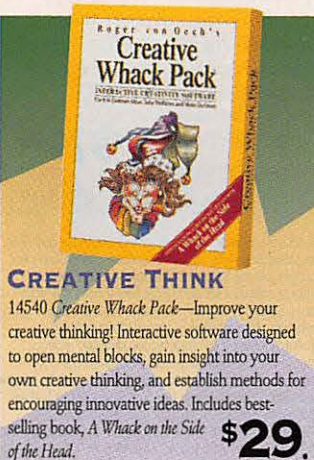
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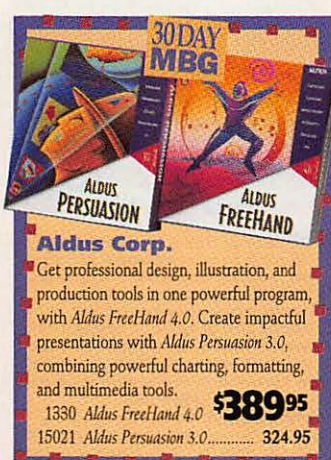


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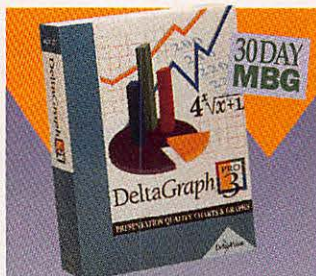
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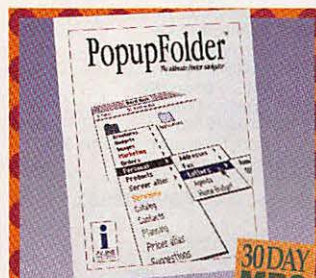
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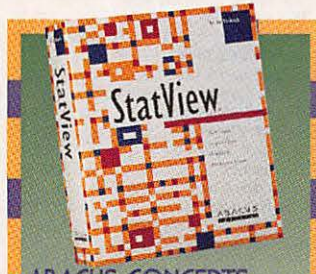
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**CENTRAL POINT**  
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# WillMaker 5.0

## Legal Software

**PROS:** Quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents; offers excellent supporting explanations, examples, and background. **CONS:** No way to search for topics or navigate within online help.

**COMPANY:** Nolo Press (510/549-1976).

**LIST PRICE:** \$69.95.



**R**IGHT AT THE TOP OF MOST PEOPLE'S avoid-at-all-costs lists are dealing with lawyers and planning for their own demise. Nolo Press's WillMaker 5.0 takes much of the pain out of the latter—partly by eliminating the need for the former.

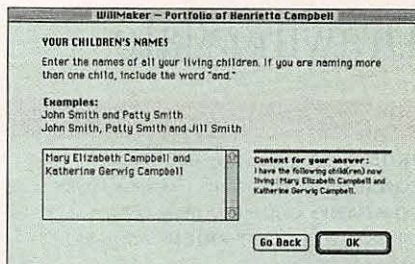
Like other Nolo Press software, WillMaker accomplishes its task by interviewing you about your needs and wishes. Brief supporting explanations and occasional recommendations accompany the questions. You can get more-detailed assistance from newly enhanced help screens specific to the questions at hand, and from the excellent manual (cross-referenced on the help screens), which describes not only the pro-

gram but also the background and legal ramifications of your decisions, all in straightforward English. You can mark help screens for easy recall later on, but you can't navigate from screen to screen in the online help or search for help on a specific topic.

Version 5.0 of WillMaker allows you to make up to 100 bequests in your will. And you can now designate a property guardian for your children, regardless of whether their property is a product of your will.

The latest version of WillMaker also helps you prepare legal documents regarding health care and final arrangements. Health-care documents include a health-care directive (more commonly called a living will), which specifies the medical treatments you want either provided or withheld should you be unable to communicate your wishes; and a health-care proxy or durable power of attorney, which gives another person the authority to see that the instructions in your health-care directive are carried out, should that become necessary. WillMaker's final-arrangements document indicates what you want in the way of burial, cremation, memorial service, and the like.

When you've answered all of WillMaker's questions, you can review and revise the resulting document, print it, or export it for printing in another program. WillMaker's own Print options are limited—you can set margins, typeface, font size,



**Where There's a Will** Before WillMaker draws up your will, you respond to questions by selecting options and entering requested text.

and line spacing—but are adequate to the task. Final documents include instructions on signing, witnessing, and (if needed) notarizing. There's even a set of legal-style storage envelopes for each type of document.

WillMaker tailors your documents to the laws of the state in which you reside, and the documents it creates are valid in all states except Louisiana. Although its range of testamentary possibilities is not adequate for very large or unusually complex estates, WillMaker's will-writing abilities should be more than sufficient for most people. Its other features are appropriate for everyone, however, and the program now lets immediate family members use its services as well.

Overall, I can't imagine an easier and more economical way of planning for the inevitable.—ROBERT C. ECKHARDT

# Snap Mail 1.01

## Electronic-Mail Software

**PROS:** Inexpensive; easy to install; definable message forms; Talk mode. **CONS:** Fixed-size window; displays only one item at a time; no font selection. **COMPANY:** Casady & Greene (408/484-9228). **LIST PRICE:** 5-pack \$200; 10-pack \$320; 50-pack \$1440.



**O**FFICE ELECTRONIC-MAIL SYSTEMS can be a bear to set up, with servers, system administrators, and gateways to worry about. Snap Mail, designed for easy setup and administration on AppleTalk networks, lets you forget those worries.

You buy Snap Mail by the user—5, 10, or 50 at a time. The package includes a single installation disk, a manual, and a quick-reference card for each user. You can install Snap Mail on each Mac or remotely over an AppleTalk network. Once installed, Snap Mail limits the number of simultaneously connected Macs to the number of licensed users; you can increase the number with a phone call to Casady & Greene.

Using Snap Mail is, well, a snap. You open the application either from the Apple

menu or with a configurable hot key, and a window appears with InBox, OutBox, and user-list panes. To send a message, you simply type it into the OutBox. (You can optionally attach files by clicking on the paper-clip button.) Then you select one or more destinations from the user/group list, press Send, and the receiving Mac instantly chimes as the delivered message appears in its InBox. A pull-down menu allows you to configure Snap Mail's numerous options for user groups, alerts, receipts, forwarding, and other preferences.

As well as being easy to set up and easy to use, Snap Mail includes two clever features: message forms and Talk mode. With message forms, you create fill-in-the-blank templates for composing standard messages such as phone notes or sales leads. Talk mode lets you carry on typed conversations in real time with any number of other Snap Mail users.

By default, Snap Mail operates in serverless mode; that is, if a destination Mac isn't online when you send a message, the sending Mac retransmits the message automatically when the destination Mac comes online. This only works, though, if the sending and receiving Macs are both online together at some time. If they aren't, you can designate a single Mac as a server to hold and forward messages for absent users.

Because Snap Mail is a low-end pack-

age, it can be forgiven the lack of such sophisticated features as gateway routing, styled text, and embedded graphics. However, Snap Mail has a few surprising and irritating shortcomings. You can't resize its main window, you can't change the size or font in which text is displayed or printed, and you can view only one message at a time. Multiple, resizable windows and selec-



**Fill-in-the-Blank** Snap Mail's definable message forms let you create standard E-mail templates, such as the one shown in the OutBox.

table fonts are fundamental features common to virtually all Mac applications; their absence in such a general-purpose tool is definitely frustrating.

Nevertheless, if you can live with these annoyances, Snap Mail will put you on the electronic-mail trail more easily and more cheaply than any competing product.—MEL BECKMAN



# DrawingSlate

## Digitizing Tablet

**PROS:** Small, inexpensive ADB device.  
**CONS:** No custom settings files; heavy stylus.  
**COMPANY:** CalComp Digitizer Division  
 (714/821-2000). **LIST PRICE:** 9-by-6-inch  
 tablet \$395.



**T**HE DRAWINGSLATE IS AN ADB TABLET with a 9-by-6-inch active area. The tablet also comes in 12-by-12-inch and 18-by-12-inch configurations. Along the tablet's top are 4 mode buttons and 18 function keys, which are programmable by means of a control panel. The tablet is covered with a transparent overlay that accommodates a drawing underneath for tracing.

The 9-by-6-inch tablet includes a three-switch, battery-powered, pressure-sensitive stylus that's about the size of a large pen. To save power, the DrawingSlate's battery-powered stylus has a sleep mode. Some operations that require precise placement, such as aligning type in a layout, are a little tricky using any stylus. The batteries in this stylus make it slightly top-heavy and therefore difficult to hold perfectly

still when you release an object. I added a heavy pen grip to the tip to help balance it, but the mouse may be easier to use for some operations.

A control panel allows you to set all parameters affecting the performance of the tablet and stylus, including orientation, macro-key assignment, stylus-switch function, screen-to-tablet mapping, and mouse or tablet mode. The control panel also includes thorough online help.

Although the control panel does not let you save multiple preference settings, you can set two separate tablet-to-screen mappings that are accessible through the mode buttons on the tablet. (As with all tablets, cursor speed is determined by the ratio of the active tablet area to the screen area.) The tablet also works with multiple monitors. You can allow the cursor to move across all screens or restrict cursor movement to one screen. The control panel also has a Wacom-compatible pressure-sensitivity scale, although Fractal Design Painter is the only commonly used application that requires this scale.

The stylus tip and barrel buttons, along with each of the 18 function buttons, can be programmed to play any key or key combination. This lets you play a program's function keys or preexisting macros using the stylus and the function buttons on the tablet.



DrawingSlate

The DrawingSlate manual is very brief, covering only the basics of operation and maintenance. Thankfully, a 24-hour BBS is available for more-esoteric issues as well as technical support and software upgrades. The tech-support staff is easy to reach via an 800 number during business hours.

Most heavyweight graphics programs take advantage of pressure sensitivity. In paint programs, pressure can vary attributes such as paint opacity, color, and rate of flow as you draw, letting you create effects that are simply not possible with any other input device. A stylus takes some getting used to, but the advantages of pressure sensitivity far outweigh that drawback. And while it's not a deluxe package, the DrawingSlate is a good, compact, low-cost implementation of pressure sensitivity.—MATT NIELSEN

# Notebook Printer II

## Portable Printer

**PROS:** Lightweight; built-in five-sheet paper feeder; prints crisp, black type; prints in color.  
**CONS:** Hard to align envelopes for printing; color printing is slow. **COMPANY:** Citizen  
 America (310/453-0614). **LIST PRICE:** \$399.



**T**HE BEST THINGS ABOUT CITIZEN'S Notebook Printer II are that it weighs only 2.6 pounds (with its NiCad battery installed) and prints crisp, clear, black type even on poor-quality paper. Its small size, 4.1 by 11.7 inches, takes up just an inch more room on my desk than a box of 40 business-size envelopes.

The Notebook Printer II is a thermal-fusion printer that uses heat to bond ink onto the paper from a cartridge ribbon similar to that of a typewriter. Because the printer doesn't spray liquid ink onto the paper—as do its major competitors, Apple's Portable StyleWriter and Hewlett-Packard's DeskWriter 310—the type of paper you use doesn't greatly affect print quality. Even on thin, nonabsorbent paper (the kind provided at the hotels where I

stay), the Notebook II produces crisp, black type that stays on the page even after repeated folding or rubbing.

The Notebook II also prints in color, with a special four-color ribbon and the included Citizen Notebook Printer II driver installed. I wouldn't use this as a color printer very often, though, because the process is wasteful (the ribbon advances through each of the four colors until it finds an area that it needs, wasting the rest); because it is slow (a 1-page Microsoft Word document with colored headings took more than 15 minutes to print); and because Hewlett-Packard's ink-jet DeskWriter printers do a much better job of printing good-looking color at a budget price. (The Notebook II's optional color ribbons are sold only in packages of five, and according to the company, the suggested price is \$6.99 per ribbon.)

With the Notebook II's built-in 5-page sheet feeder, you can easily align sheets of paper, a task that can be a difficult on tiny printers. The Notebook II also has an ingenious design that stacks finished sheets on top of the printer so that they don't get in the way of the sheets being printed. To print envelopes, you stand the printer on its back and feed the envelopes manually

through a slot in the back. This works well enough, but because they go in flap-first, aligning the envelopes can be difficult (you're feeding in an angled edge). An optional 30-page sheet feeder is available (\$69), but the Notebook II is too slow to be effective when printing documents much longer than 5 pages.

If speed is worth a few extra pounds to you, buy HP's DeskWriter 310. With the battery installed, it weighs 1.7 pounds more than the Notebook II, but it prints text nearly three times as quickly.

Moreover, if gray-scale or color printing on the road is what you care about, the Hewlett-Packard DeskWriter 310 does a better job on both types of graphics documents. Although you can recognize a photograph printed using the Notebook Printer II, the image is disappointing: all the dark tones blur together, and the light shades don't stand out.

But if weight and size are your biggest concerns in choosing a portable printer, and if you print primarily in black-and-white, choose the Notebook II. Its text-print quality is sharper than that of its ink-jet brethren, and it's better at handling a wide variety of paper types. If there's any chance you'll need a printer where you're headed, pack this one. You won't regret it. I've packed shoes that were heavier and bulkier than the Notebook II. —LIZA WEIMAN



WE'RE REDEFINING  
WHAT YOU SHOULD EXPECT  
FROM A PRINTER.



# FlipBook 1.0

## Animation Printing Tool

**PROS:** Easy to use; fun; excellent output.

**CONS:** On the expensive side. **COMPANY:**

S. H. Pierce (617/338-2222). **LIST**

**PRICE:** \$89.



ONCE UPON A TIME, IN THE DAYS before computers talked and digitized video, people made movies using a pen and paper. These movies, called flip-books, consisted of a series of images drawn on paper that, upon application of an extremely technical thumb-and-forefinger method, appeared to move.

The ice-age period of filmmaking is long gone, but never fear—S. H. Pierce has come up with a software product that lets you return to the past. FlipBook lets users make their own flip-books out of Scrapbook files, QuickTime movies, and PICS animations.

To create the flip-book pictured here, I used my highly developed artistic skills to draw several images in Adobe Photoshop. I then copied the images to my Scrapbook and opened the Scrapbook from FlipBook.

(In order to import correctly, the images in the Scrapbook must all be the same size.) Once I opened the Scrapbook in FlipBook, my eight images appeared as a movie that I could play.

You can also import a QuickTime movie. For both movies and line art, the type of image you use will affect your output. Images with minimal color contrast will not print as nicely as those with highly contrasting colors.

The FlipBook application enables you to open and play files and prepare them for printing. The software has no image-editing or animation functions, so to make the most of this product, you will need your own image-editing program. FlipBook's limited functions make its price of \$89 seem



**My Flip-book** Do you really need a computer to do this? I drew this stunning series of images in Adobe Photoshop and copied them to my Scrapbook, and FlipBook made them into a movie.

a bit high—even its approximate street price of \$60 is a little more than I would pay for this product.

FlipBook comes complete with 50 sheets of perforated paper for printing your flip-books, and S. H. Pierce also sells the paper separately (50 sheets with 10 cards a sheet for \$16.95). The Flip Setup option

allows you to select the paper type, add guidelines, and choose the side on which to bind the book.

FlipBook requires 2MB of RAM and about 900K of disk space. S. H. Pierce says FlipBook is compatible with both QuickDraw and PostScript AppleTalk printers. I printed samples on an Apple LaserWriter IINTX, and print quality was excellent. The product also comes with Lafe Locke's *Film Animation Techniques* (Betterway Books, 1992), a book for beginning animators that gives guidance on what types of images will create the best flip-book.

FlipBook doesn't do much besides help you make flip-books. It is good at its job, though, and if you want to make flip-books out of your digital images, you may want to

shell out \$60 or \$70 for this product. Of course, you could also just print your images and arrange them into a flip-book yourself. For the bored executive or for parents who want to educate their children about the olden days, FlipBook is a good high-tech option for a low-tech task.

—JOANNA PEARLSTEIN

# UnderWare 1.0.1

## Screen Saver/Desktop Enhancer

**PROS:** Amusingly animates your desktop;

can use most After Dark modules. **CONS:**

Desktop animation can slow foreground processes;

uses 5.8MB of disk space. **COMPANY:** Bit

Jugglers (415/968-3908). **LIST PRICE:** \$59.95.



TERMS LIKE *WACKY* AND *SILLY* ARE usually not what software authors hope to hear about their first product. But when applied to Bit Jugglers' UnderWare, they're a compliment. UnderWare is a control panel that adds three features to your Mac's desktop. It's a screen saver. It allows you to personalize your dull desktop with one of dozens of patterns. But UnderWare's unique claim to fame is its ability to run animations on your desktop, *underneath* your windows and icons.

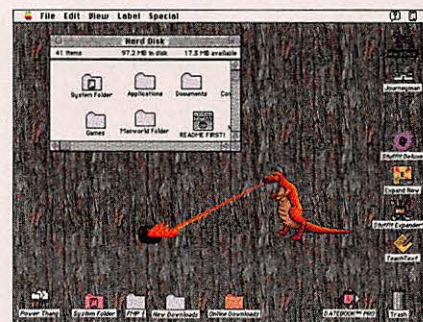
If these animations don't make you grin, you may need a humor transplant. Cartoon babies crawl across your screen in the Babies module, pausing briefly while thought balloons with text that you've defined pop up above their heads. With the Dragon module, a fire-breathing saurian

burns holes in your desktop. Ballerinas pirouette; a *T. rex* stomps; and the Jungleman swings on vines across your screen. You can even have Rubber Chickens flying in formation.

Better yet, many animations interact with your desktop's icons and windows. The Robber skulks on screen, rummages through the icons, then gets chased off screen by the cops. Jungleman is likely to slam into the side of an open window. And many of the modules act differently when used as screen savers. For example, Blastoff launches rockets from the bottom of your screen when used as a Desktop Animation; when it's a screen saver, your desktop's icons rise on a jet of animated flame.

The price you pay for this whimsy is mostly measured in disk space; full installation takes 5.8MB, and gives you 100 desktop patterns and 26 animated modules. If you have a 640-by-480-pixel screen running in 8-bit mode, UnderWare takes a moderate 80K of RAM. Also, the program is good about not slowing your Macintosh; the Desktop Animations halt when UnderWare senses your Mac is busy, such as with mouse, keyboard, or network activity, or when the serial port is receiving data from a modem.

UnderWare can also run Berkeley Systems' After Dark modules, except for the Star Trek and Disney module sets.



**Dragon Halitosis** A not-very-fearsome fire-breathing dragon wanders across my desktop, burning a hole in the Tree Bark pattern I've selected.

UnderWare has a few incompatibilities with older versions of some utilities. It doesn't work with Connectix's PowerBook Utilities 2.0 or Symantec's CopyDoubler 2.0.1; updating to the latest versions of these programs, 2.0.1 and 2.0.3, respectively, fixes the problem. As I was writing this review, Bit Jugglers released a free updater program (version 1.0.1) that fixes minor incompatibilities. The updater is available on America Online, CompuServe, and AppleLink.

There's no businesslike reason to have UnderWare running on your Mac. But don't underestimate the value of a smile while you work. UnderWare is inspired, silly fun for your Mac's desktop.

—TOM NEGRINO



**Flexibility** (flek·sə·'bil·ət·ē) *n.* 1. A feature previously not found in this category. *example:* For under \$800, **TI microWriter™** printers with **Adobe® PostScript®** give you more networking and paper handling flexibility than Apple and HP, at a lot lower price.



## THE UNDER \$800 PRINTER, REDEFINED.

If you're looking for a PostScript printer with a street price well under \$800\*, you'll have a hard time finding one with as many features as a TI microWriter.

Just look at the chart and compare it to our leading competitors, Apple and HP. Then, when you're ready for a full-featured printer that's truly flexible, at a price that's truly affordable, take a look at a TI microWriter. For more information or a dealer near you, call **1-800-TI-TEXAS** (1-800-848-3927).

	TI microWriter PS23	Apple LaserWriter Select 320	HP 4ML
Print Speed	5 ppm	4ppm	4 ppm
Mac/DOS Compatibility	Standard	Mac Only	Standard
Paper Trays	(std.) 250 sheet	100 sheet	100 sheet
	(opt.) 250 sheet	Not Avail.	Not Avail.
Auto Emulation Switching	Standard	Not Avail.	Standard
List Price	\$799	\$959	\$1279

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Specifications in chart are based on information as of 3/94. \*Estimated dealer price. Dealer prices will vary. microWriter and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. © 1994 TI.

Circle 265 on reader service card



# SimCity 2000

## Simulation Game

**PROS:** Lovely graphics; easy-to-use palette; complex yet straightforward; entertaining and engrossing. **CONS:** Minor bugs and annoyances. **COMPANY:** Maxis Software (510/254-9700). **LIST PRICE:** \$69.95.



SOME MAXIS SIMULATIONS ARE SO complicated that the learning curve is more like that of a 3-D rendering program than a game. But SimCity 2000 is both dazzlingly simple and fascinatingly complex.

In essence, the goal is to build a city and run it successfully. You need to develop a solid infrastructure, including a water system (new in this version), power supply, roads, and public transportation. You face urban problems, such as high crime and traffic. You also face natural disasters—and some that are unnatural, such as monsters and chemical spills.

An easy-to-use palette gives you all the tools you need. Its top 15 buttons provide the ingredients: zoning, landscaping, and city services. The zone tools now include libraries, museums, prisons, marinas, and

zoos. You can tear other buttons off the palette, creating windows that provide detailed information about your city. The windows show charts, graphs, maps, and visual displays of everything from pollution levels to your city's budget and tax rates.

But playing the game is only half the pleasure; SimCity 2000 is also fun to watch. As you provide zones, the Sims (the people who live in your city) build. And their buildings are incredibly detailed. From quaint bed-and-breakfast inns to convenience stores, condos with swimming pools, and industrial thingamajigs, these are buildings that real people could live in.

The detailed help system is easy to access. Hold down the shift key and click on any button; the help window explains what that button does. There is also a query tool for information about any building.

To completely describe the game would take about 140 pages—the length of the well-written and entertaining manual. Briefly, other features include arcologies—huge, enclosed cities within your city; new types of power, including wind power; newspapers giving the Sims' opinions; and a terrain generator that lets you develop a landscape to your own specifications.

Alas, SimCity's not perfect. Various minor bugs and misguided features are annoying. It's hard to plan a subway around your water system, and there's no way to



**First Light** J. Scirica is the lucky Sim captain of all the Sim boats in all the Sim cities. Meanwhile, the map in the bottom corner shows that my city's water system needs help.

view only one or the other. There's also no easy way to see the entire subway, as, unlike the roads and trains, it's not included in the map window. Ordinances get passed without your approval, and you may have to shell out thousands for energy conservation when a new power plant would be much cheaper. Furthermore, when your city gets big, some building descriptions no longer contain useful information. And finally, the newspapers all assume that the mayor is male—a minor, but depressing, sexism.

Overall, though, SimCity 2000 is marvelous. Maxis has done a superb job of improving on an already good thing.

—WENDY SHARP

# Crystal Crazy

## Arcade Game

**PROS:** Fun; challenging; great sounds and graphics. **CONS:** Zinkleflashoxicationizers are really nasty. **COMPANY:** Casady & Greene (408/484-9228). **LIST PRICE:** \$49.95.



CRYSTAL CRAZY IS AN ULTRAGLOSSY, superpolished version of Casady & Greene's Mac game Crystal Quest. Crystal Crazy is an arcade game played in successive levels, or waves. You are in command of a small chickpea-size spaceship that is trapped in a wave until you've completed that wave's objective. Objectives range from picking up crystals to wiping pictures clean to smashing fragile objects (my personal favorite). This probably sounds easy, but wait until you're confronted by the Nasties. Nasties are various forms (20 in all—once called Zinkleflashoxicationizers) of space aliens whose antics change from dopey to devious as the waves progress.

A wave starts with your ship in the middle of the game area. Portals on both sides spit out Nasties at random intervals. The exit gateway at the bottom of the

screen remains closed until you complete your objective.

You score points in several ways. During wave play, you collect points by sliding over point boxes, sailing after bonus crystals that appear randomly, and killing Nasties. Escaping a wave before the preset time yields bonus points.

The best way to rack up points is the bonus wave, which occurs after every third wave. In this free-for-all bonus wave, you collect point boxes, a few smart bombs, and sometimes ships—without worrying about the various Nasties. But you must select these points before two slowly moving doors smash your spacecraft.

Randomly appearing throughout the levels are five shields and five special guns that you can pick up to help defend yourself. The shields range from the rubber hat (protects against mines, portals, and gateways but doesn't keep you from crashing into Nasties or being hit by bullets) to the MaceHead (obliterates Nasties but doesn't protect you from bullets). The special guns include a multigun (sprays four simultaneous streams of bullets) and the Captivator (captures Nasties and tows them along).

But wait, there's more to Crystal Crazy than just great game-playing excitement. You can adjust the sound level from within the game, and pause play by hitting the tab key. All new games start with wave one,

unless you save a game in progress. And large-monitor owners can expand the playing area to the full screen size.

The status bar at the top of the screen displays information about your current ammunition supply, points, and weapons status, among other things.



**Nasties Battle** Your ship (lower right, with spiked armor) is surrounded by dispensers, mines, and Dronefuls. As quick as your jets can jive, you can collect the smart bombs, bonus points, and crystals. Then unpaint the pictures before escaping through the portals.

Crystal Crazy is everything a computer game should be. It's challenging and fun without being impossible. Each level has some old elements, with a few new ones to keep you on your toes. It took five games to get a million points, pretty good for a Pong throwback like me.—MATT CLARK



**Compatibility** (kəm·pat·ə·bil·ət·ē) *n.* 1. A feature rarely found in this category. *example:* The **TI microLaser™ Pro 600** gives you Mac®, DOS, Windows™, PostScript® and PCL®5 compatibility standard. HP charges hundreds more.

## TI MICROLASER PRO 600

Compatibility. According to the dictionary, it means capable of existing together in harmony.

Some famous movie couples had it. Some famous dance teams made it an art. It's what keeps marriages together. It forms the basis for mega-mergers between billion-dollar

But the reality is, we tend to buy different products from different people, depending on our needs. And once we have the ideal products, we try to link them together.

It brings a whole new meaning to the idea of compatibility.

Your printer. Those products may not all be compatible with each other, but they all have to be compat-

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## THE UNDER \$1400 PRINTER, REDEFINED.

When we set out to design the ideal 600 dpi printer, we asked thousands of users what they wanted most. And the result is the TI microLaser Pro 600. As you see from the chart, not only do we give you more, we charge you less. And if blazing speed for heavy graphics printing is required, check out our 40MHz PowerStep™ upgrade. It's a great way to protect your investment as your processing needs become more complex. For more information or a dealer near you, call 1-800-TI-TEXAS (1-800-848-3927).

	TI microLaser Pro 600	HP LaserJet®4M
True 600 dpi	Yes	Yes
Speed/Processor	8ppm/RISC	8ppm/RISC
Emulations	PCL5/Adobe® PostScript 2	PCL5E/Adobe PostScript 2
40MHz Processor Upgrade	Optional	Not Available
Compatibility	Mac/DOS	Mac/DOS
Toner Cart. Life	15K pages¹	6K pages
Paper Trays	250/250 sheet	250/100 sheet
List Price	\$1599*	\$2479

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Specifications in chart are based on information as of 3/94. \*Estimated dealer price including manufacturer's rebate is under \$1,400. Dealer prices may vary. †At 4% coverage. ††Rebate applies to PS 23 and PS 65 models purchased April 1, 1994 through June 30, 1994. microLaser, PowerStep and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Windows is a trademark of Microsoft Corporation. Mac is a registered trademark of Apple Computer, Inc. LaserJet and PCL are registered trademarks of Hewlett-Packard, Inc. © 1994 TI.

Circle 266 on reader service card



# Firefall Arcade

## Arcade-Style Game

**PROS:** Brilliant graphics; easy to pick up. **CONS:** Mindless fun (if that really is a con); nothing new. **COMPANY:** Inline Software (203/435-4995). **LIST PRICE:** \$49.95.



**H**ARK BACK TO THE HEYDAY OF video arcades . . . remember Centipede? In Firefall Arcade, the centipede is called a fireworm, but the game is still a fun way to waste time. The fireworm races down the screen, bumping into barriers, changing directions, splitting into pieces, and plummeting toward your ship at high speed. Shoot it! See it pop and segment! Destroy six worms and you're on to the bonus round.

The screen is bordered by brick walls. A status box containing score, level, and number of lives is on the right. Destructible barriers, among which the fireworms career and you maneuver, litter the screen. There are also everlasting barriers, which creep from the sidelines and float into position among the normal barriers. While they're mobile they're vulnerable; once they're fixed they're (almost) indestructible.

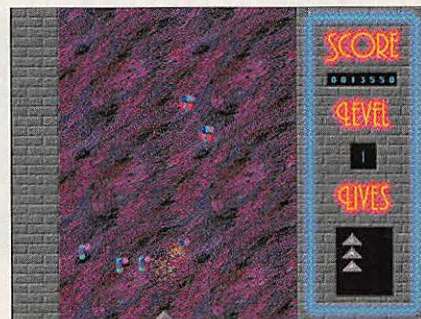
The fireworm isn't your only target or danger: barrier droppers excrete destructible barriers and kill on contact; slide-worms—lethal spinning pasta—also destroy on contact; and prisoner cubes dog you, always trying to herd you toward disaster. If one touches you, you explode.

On your side are temporary power boosters called powerups. Powerups give you shields, double- and treble-shot guns, and free lives; they also freeze targets and dephase your ship (allowing you to travel through barriers). There are also several helpers—some might call them cheats—hidden in the game (just think of keys and developers' names).

To play Firefall Arcade, you need 256 colors and at least a 13-inch monitor, plus about 3.4MB of RAM. The game runs on anything from an LC up. On an 040 machine you can play in enhanced mode, with even more graphics and longer fireworms.

You won't need to read a manual or spend hours learning this game. There is, in fact, no manual, only a threefold card, which lists all the information you need to play: key commands, point values, the different powerups, tech-support numbers, strategy, and installation instructions.

The action on Firefall Arcade seems to change with the input device. I played it with the Apple Desktop Bus Mouse II, the Kensington Turbo Mouse trackball, and the



**Bonus Round** A flying worm swoops into range three times. You get a 10,000-point bonus for each worm destroyed.

Advanced Gravis GamePad, and found none completely satisfactory at first. I experienced restricted or slow movement or an irritating float factor that sent me coasting into death traps. However, a call to Inline's tech support set me straight on optimum settings (use the penultimate fast setting for the Apple mouse and the Deliverance game-set for the GamePad).

I wish Firefall Arcade had a save-as-you-go option, but in that respect it's very arcade-like: when you're outta lives, that's it. While the designers have really added nothing new to an old video game, if you loved Centipede or are just looking for a fun shoot-'em-up, Firefall Arcade will satisfy. —SUZANNE COURTEAU

# Spin Doctor

## Arcade Game

**PROS:** Flexible environments encourage experimentation; play is challenging and engaging. **CONS:** Time limits need adjustment. **COMPANY:** Callisto Corporation (508/655-0707). **LIST PRICE:** \$59.95.

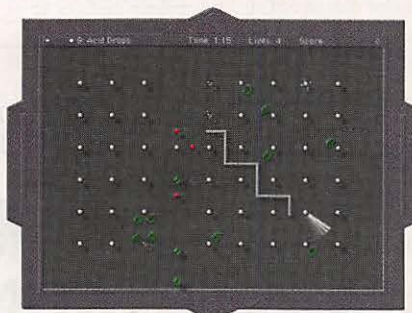


**S**PIN DOCTOR ISN'T MERELY AN arcade game; it is part strategy game and part kinetic sculpture as well. In it, you are a wand rotating endlessly around a dot in a land of dots. You can hop from one dot to another, bounce off dots, and switch directions, but you can never stop. Meanwhile, you have to negotiate a variety of obstacles to arrive at the goal—a particularly shiny dot that takes you to the next level. The obstacles include walls, killer spikes, enemy wands, and puddles of acid that chase you around the screen.

The strategy comes in deciding when to move and when to use available resources, including door switches, fuses attached to bombs, and so-called hyperdots that transport you to different parts of the screen. For example, you can use a bomb to

blow up a door switch; this holds the corresponding door open so you can pass through it at your leisure. But you might also have to blow up a bonus dot that would have boosted your score. Much to its credit, Spin Doctor doesn't require you to carry out any specific action. You can pass through a level simply by moving adroitly and cautiously, or you can take advantage of every resource around you. No single decision means certain success or failure.

To keep things interesting, Spin Doctor includes 106 playing environments and 4 levels of difficulty. The first 10 or so environments walk you through the elements you'll encounter, in effect, teaching you



**That Burning Sensation** When you pass your spinning wand over a green acid puddle, the puddle wakes up and chases you. If you're quick enough to escape the acid, it drips harmlessly off the screen.

how to play the game. In fact, most folks will be able to set about playing without reading the slim manual. With the possible exception of the strange keyboard controls, Spin Doctor is totally straightforward.

The first level of difficulty lets you play very slowly with no time limit. At this level, the game feels more like solitaire than an arcade game. Each higher level increases the speed at which the wands rotate and limits the time you can spend in an environment. The time limits are usually appropriate, but every once in a while they seem either too long or too short. On rare occasions, I could meet the time limit only by recklessly ignoring every obstacle and hoping for the best as I hurled my wand toward the goal. At other times, I could easily reach the goal with more than half the time remaining.

If you're looking for a challenge, however, Spin Doctor delivers. Some environments look absolutely impossible at first glance and require a few minutes of study before you can even approach them. Better still, the game takes frequent twists, forcing you to question the lessons you learn along the way; just as you master weaving between enemy wands, for example, the enemies slow down, completely upsetting the rhythm you've developed. In the tradition of the best Macintosh games, Spin Doctor tests your wits and your reflexes alike.

—DEKE MCCLELLAND



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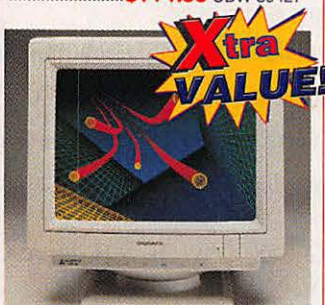
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TelePort Gold 14.4K Ext.	273.60
TelePort Mercury 19.2K Ext.	314.37
GlobalFax Duo software	76.65

### Hayes

Mac ACCURA 2400	75.78
Mac ACCURA 9600/FAX96	152.26
Mac ACCURA 14.4K/FAX14.4	161.49
Mac ACCURA 2400/FAX96	134.27
Mac OPTIMA 9600/FAX96	349.95
Mac OPTIMA 14.4/14.4 Pocket	316.16

### Supra

Mac 14.4/14.4 FXMT	189.50
Mac 14.4/14.4 Pocket	314.59
Mac 14.4/14.4 FXSA w/LCD	404.87
Mac 14.4/14.4 w/LCD	219.40
Mac LC 14.4/14.4	158.20
Mac PowerBook 14.4/14.4 Int.	219.55

### Robotics

Mac Sportster 14.4/14.4	199.80
Mac WorldPort 14.4 Pocket	236.00

## Storage Systems

### FWB

FWB Hard Disk Toolkit	125.82
Hard Disk Toolkit Personal	49.95
PocketHammer 170MB	469.63
PocketHammer 240MB	534.91
PocketHammer 530FMF 530MB	994.23
PocketHammer 1000FMF 1.0GB	1178.48
PocketHammer 1800FMF 1.8GB	1798.48
PocketHammer 2100FMF 2.1GB	2018.04
HammerPB 210MB PowerBook Int.	604.44
HammerPB 340MB PowerBook Int.	644.42
Hammer 2000FMF 2.0GB	2579.54
Hammer 2100FMF 2.0GB	2385.48
Hammer 2800FMF 2.8GB	3149.98
HammerDisk 44MB Syquest	449.83
HammerDisk 66MB Syquest	534.21
HammerDisk 105MB Syquest	1099.95
HammerDisk 600MB Optical	2449.10
Hammer Tape 525MB External	937.50
SCSI Jack-Hammer	819.30
SledgeHammer 2000FMF 2.0GB	2239.72
Hammer external enclosure	153.34

### MEGA

MacFloptical 21MB	449.88
MacTransportable Bernoulli 90MB	339.42
MacTransportable Bernoulli 150MB	499.83
MacTransportable Bernoulli 150MB	499.80

### Micronet

C Pack 80MB	397.80
C Pack 120MB	396.45
C Pack 240MB	475.19
C Pack 155MB Tape Drive	729.32
C Pack 600MB Tape Drive	911.12
SS-240 240MB Ext.	492.99
SS-313 313MB Ext.	549.98
SS-414 414MB Ext.	812.95
SS-540 540MB Ext.	1079.78

### PLI

Infinity 88MB Syquest Int.	369.95
Infinity 88MB Syquest Ext.	489.90
Infinity 105MB Syquest Int.	367.10
Infinity 105MB Syquest Ext.	413.90
Infinity 270MB Syquest Int.	534.82
Infinity 270MB Syquest Ext.	614.81
Infinity 21MB Floptical	317.72

Infinity 21MB Floptical Ext.	379.34
Infinity 1.3GB MaxOptical Ext.	2828.23
Infinity 600MB MaxOptical Ext.	1438.09
Infinity 600MB Optical Ext.	2458.67
PLI 44MB Syquest Cart formatted	74.47
PLI 88MB Syquest Cart formatted	109.22
PLI 105MB Syquest Cart formatted	72.27
PLI 270MB Syquest Cart formatted	106.01

## SCSI hard drives

Conner 343MB SCSI-2	335.99
Conner 1.0GB SCSI-2	865.82
Micropolis 1.05GB SCSI-2	869.72
Micropolis 1.05GB AV SCSI-2	918.75
Micropolis 1.75GB SCSI-2	1189.05
Micropolis 1.75GB AV SCSI-2	1239.53
Micropolis 3.0GB SCSI-2	2039.00
Seagate 1.0GB SCSI-2	853.22
Seagate 1.69GB SCSI-2	1589.80
Seagate 2.1GB SCSI-2	1546.38
Seagate 2.9GB SCSI-2	2149.85

## Input Devices

### CalComp

DrawingSlate series	
6x6 corded pressure stylus	236.24
12x12 cordless 4B cursor	246.55
12x12 cordless 16B cursor	246.55
12x12 cordless pressure stylus	474.52
12x18 cordless 4B cursor	269.53
12x18 cordless 16B cursor	369.53

### EPSON

Epson 800C Pro	1247.94
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### Logitech

Logitech MouseMan	63.90
Logitech TrackMan	49.88
Logitech ScanMan 32	258.20
Logitech PhotoMan Plus	568.61

### Microtek

35T Slide Scanner	1361.23
ScanMaker II	338.91
ScanMaker IIXE	1009.59
ScanMaker Auto Doc Feeder	369.54

### Wacom

6x8 Artz ADB, cordless pres stylus	277.49
12x18 Standard, cordless pres stylus	972.95
12x12 Electrostatic, cordless pres stylus	714.70
12x12 UD-series, cordless pres stylus	507.59
12x18 Electrostatic, cordless pres stylus	967.74
18x25 Standard, cordless pres stylus	2554.28
CORDless 4B cursor	36.95
Cordless standard stylus	63.67

## CD-ROM/Multimedia

Micronet CD-ROM 325ms	657.43
NEC MultiSpin 3x6 195ms	558.92
NEC MultiSpin 3x1 195ms Int.	479.90
NEC MultiSpin 3x6 portable	427.59
NEC MultiSpin 4X Pro	867.18
Pioneer 8 Disc Quadraspin	1148.00
Plexor DM5028 240ms Int.	9999.00
Plexor DM5028 240ms Int.	9999.00
PLI CD-ROM 200ms	389.32
PLI CD-ROM 320ms	411.36
Toshiba 3401 200ms	489.55
Toshiba 4 Drive Tower 200ms	669.80
Media Vision PAS 16 NuBus	358.80
Altec Lansing ACS100 Spkrs	126.62
Altec Lansing ACS300 Spkrs/SubW	274.25
Yamaha 10 Watt Computer Spkrs	89.95
Yamaha Hello Music! MIDI	259.80

## Printers

DeskWriter 550C	438.14
LaserJet 4M	1058.52
LaserJet 4MP	1489.89
LaserJet 4M	1899.84
LaserJet 4M MX	4506.35
DeskJet 1200C	2096.47

### NEC

Silentwriter 640	788.53
Silentwriter 1087	1377.80

### TEXAS INSTRUMENTS

microLaser Pro 600 PS23	1374.71
microLaser Pro 600 PS65	1529.04

## Power Backup

BC250	99.11
BC400	148.89
BC500	189.42
BC500 LAN	190.40
BC600 LAN	249.00
Smart 250 LAN	232.46
Smart 400 LAN	279.87
Smart 500 LAN	309.09
Smart 600 LAN	334.91
Smart 750 LAN	428.53
Smart 900 LAN	525.64
Smart 1250 LAN	659.68
Isobar 4	38.95
Isobar 6	48.38

## Performance Upgrades

### Daystar

PowerCache 33MHz w/FPU	357.03
PowerCache 50MHz w/FPU	537.05
Value 040 33MHz	926.12
Value 040 40MHz	1089.22
Turbo 040 33MHz w/FPU	907.30
Quad 040 w/128K	1247.48
Image 040 40MHz w/128K, DSP	1829.85
FastCache Icd 64K	202.80
FastCache Quadra	296.83
Charger	875.83
Charger Plus	837.46






#### Macs in the Movies

With the right equipment, a high-end Mac or two become the heart of a film or TV studio's postproduction facility. The author's studio (shown here) uses a Quadra-based system to produce commercials and short films.





# VIDEO- EDITING TOOLS

How to find the Mac tools that  
meet pro standards

a

lthough the Macintosh has brought revolutionary changes to diverse professional fields—publishing and music, to name but two—video production remains an elusive target. Barely a year ago, still in its infancy, video on the Mac meant watching a stuttering QuickTime movie the size of a Sony Watchman.

Now, thanks to better compression algorithms and dedicated compression hardware, the infant has grown into a precocious child—walking and talking full-screen (at 640-by-480-pixel resolution) in real time (30 frames per second, or fps). Equally important innovations are happening on the front end, as a growing number of sophisticated Macintosh editing and effects tools become available. Finally, high-quality I/O signal-pro-

cessing technology is building a better gateway from the Mac's RGB environment to the analog and digital video formats used by professional video editors.

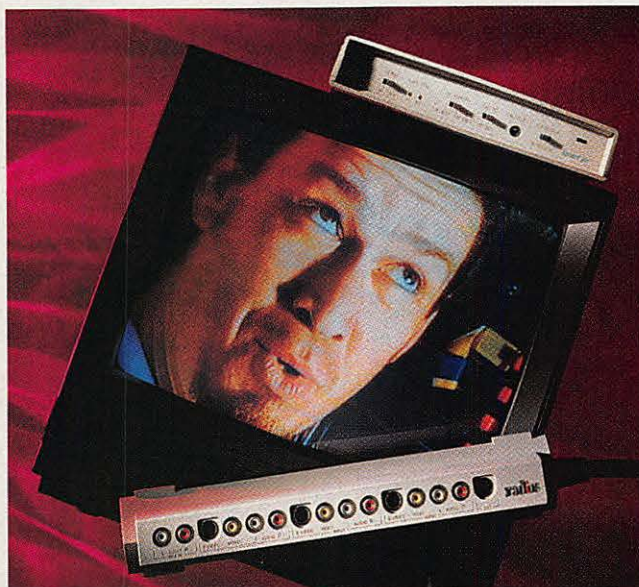
The technology's progress is so encouraging that even the high priests of traditional postproduction—the keepers of the broadcast waves—have finally begun to read the binary on the wall. And at less lofty levels, the benefits are here now for advertising agencies and others who need to produce video proposals quickly and at relatively low cost.

**BY AVI HOFFER**



**Presentation Picks**

The encoder boxes used by the RasterOps MoviePak2 Pro Suite (top) and the Radius VideoVision Studio produce high-quality videotapes.



MARK JOHANN

Many people don't need the highest-level systems. For example, if you produce in-house video proposals, presentations, or the like—what we call corporate video—several lower-priced systems are available that offer decent quality. And you can expect the professional-level technology to migrate down to more affordable systems, so you'll eventually get the high quality the pros have now.

Whatever your needs, chances are there is a tool that can help you. I tested three video-editing bundles—from Radius, RasterOps, and SuperMac Technology—by using them on real video projects to see what they can really do, starting from the simplest product to the most sophisticated. Because the promise of marrying computers and video production lies in the ability to manage video, I've covered only *nonlinear* systems—those that let you work with different video clips, in any order. (These random-access systems differ from linear systems in the same way that hard drives differ from sequential-access tape drives.) Most systems covered here are *offline*, which essentially means that the Mac records the instructions on how to assemble the video in an *edit-decision list* (EDL) and then assembles the completed video on tape based on those instructions. Offline systems require fewer resources than *online* systems, but online systems let you create high-quality video directly, without assembling on tape separately.

To see if there's a system that matches your needs, read on.

**Presentation Video**

The establishment of the JPEG (Joint Photographic Experts Group) standard for image compression spawned the first generation of affordable NuBus compres-

sion cards for full-screen image capture and full-motion playback. These are particularly suited for presentations and other multimedia work where the image will be viewed on a computer screen.

JPEG technology is far from being a digital video panacea—the “standard” is not universal, and full-screen QuickTime movies don't always play back with the codecs (coder/decoder) used in other companies' products. (For example, a movie created with a SuperMac codec may not play back smoothly with a Radius codec.) Still, JPEG has a wide compression-ratio range, it can randomly access individual frames of video (letting the Mac deal efficiently with large quantities of time-based media), and it has become more economical.

SuperMac Technology's Digital Film (\$3799, 408/541-6100) was the first of the video-editing products with JPEG compression boards to ship. Plagued by early digitizing and playback problems, Digital Film version 1.5 has been retooled to deliver 60-field interlaced playback (in the United States' NTSC IV standard, video has 2 fields per frame and 30 frames per second; the use of two fields per frame is called interlacing) and visual quality comparable to VHS videotape.

Just recently, RasterOps packaged the 60-field MoviePak2 Pro Suite (\$4199, 801/785-5750), which includes the 24XLTV display adapter, a MoviePak2 compression daughtercard, and the Video Expander II RGB/NTSC encoder box. (This suite replaces the earlier 30-field Editing Aces Suite.) Radius was the last to enter the video-editing fray, with VideoVision Studio (\$4499, 408/434-1010). Apple also sells two video-editing systems that repackage many of the products covered here (see “Apple Video/Media Bun-

dles,” *News, Macworld*, April 1994).

With the appropriate software, these compression cards function both as offline, nonlinear editing engines and as video processing/compositing systems.

**Image quality** The Radius VideoVision Studio was the first product to deliver all 60 fields of interlaced video per second (earlier products captured every other field and interpolated the missing one), and it still maintains the best overall picture quality of the three systems I tested.

The MoviePak2 closely rivals the VideoVision's picture quality, plus the MoviePak2 has the advantage of modular construction, better controls over and quality of JPEG compression, and support for 24-bit color on monitors as large as 19 inches. In fact, the MoviePak2's software is simply better designed and implemented, which results in higher quality, more flexibility, and increased control. While the MoviePak2 Pro Suite doesn't come with any on-board audio support (RasterOps assumes you will use the built-in 8-bit audio that comes with most new Macintosh models), you can configure the system with RasterOps' \$999 MediaTime or with a third-party board to get 16-bit, CD-quality audio.

SuperMac's Digital Film falls behind both the RasterOps and Radius products in terms of picture quality (it is limited to 320-by-480-pixel capture and doubles the 320 horizontal pixels to 640). But it comes with a better software bundle—Adobe Premiere, Diaquest's DQ TimeCoder, Macromedia's Director, and CoSA's After Effects 1.1 (the latest version is 2.0).

No matter which product you use, note that on-screen picture quality varies along a spectrum depending partly on the resolution of the source video and partly on the amount of compression chosen. Not surprisingly, color bleeding and signal noise visible in multigeneration video material is made worse by JPEG compression. The best digitizing results come from the first-generation Y/C output of SVHS, Hi-8, and newer Betacam video recorders, which reduces cross-talk distortion among colors. But better input, better output is the rule only up to a point: even at maximum quality settings, for example, output from even the VideoVision Studio or MoviePak2 never exceeds the image quality of ¾-inch SP videotape (a format, often used by professionals, with twice the resolution of VHS videotape). The SuperMac card falls short of that mark.

Playback integrity fluctuates according to several factors, including hard drive speed, RAM allocation, and the number of enabled system extensions (INITs). Even with a Quadra 950, 64MB of RAM,



and a speedy 2.2GB disk array, frames drop out here and there. (This is most noticeable in lip-synced footage, which I've found tends to get the most reliable playback on the widest variety of Mac configurations when digitized and played back at 320-by-240-pixel resolution.) The MoviePak2 uses an adaptive compression feature called DynamicQ to get the best balance between visual quality and constant data flow; this minimizes the number of frames dropped.

Using these cards to send edited video back to tape hides some of the imperfections caused by compression; the artifacting around object edges and areas of saturated color tends to get masked by the videotape recorders' lower NTSC resolution. Of the three products, Video Expander II of the RasterOps MoviePak2 Pro Suite is the best NTSC encoder: its genlock capability, adjustable subcarrier, and horizontal phase settings help deliver a clean, stable output signal. The Expander's signal-timing adjustments also make it possible to integrate a Mac into a larger studio environment, which typically requires such fine-tuning controls.

The Radius VideoVision Studio's convolution technology results in flicker-free output, but the trade-off is a slightly softer focus and less horizontal and vertical blanking integrity—important considerations for broadcasting or tape duplication.

All this pixel-splitting aside, be advised that only under optimum conditions—low compression rate plus blazing CPU and hard drive speed—can you achieve more than decent VHS-quality output. Consequently, for professional video production, these products are mainly offline tools for organizing images and ideas.

**Editing** As editing systems, all three products suffer from the same malady: amateur editing software. All are bundled with Adobe Premiere, which—for all its popularity and excellent effects-generating features (see "Video Production Techniques," in this issue)—cannot be considered a serious editing tool.

First, Premiere lacks the sophisticated trim functions and shot-management strategies that professional editors demand. For example, to cut matching action, editors need to see the outgoing and incoming frames on a cut and easily adjust the frame marker without waiting to build a preview. Premiere version 3.0 goes a long way toward accelerating preview and effects construction, but it still takes more time than professionals have to give.

Second, Premiere's insert and splice commands are click-and-drag oriented; there are no alternative ways to manipulate an edit with numerical keyboard trims, as professionals would expect. For

## Editing Video: Which Tools Do You Need?

by Jim Feeley

### BASIC TAPE EDITING

#### Your Goal

To use your Mac as a control device to organize video footage into finished tapes. (You don't need to create special effects or add titles in the video.)

#### What You Need (cost: \$1650-\$3700)



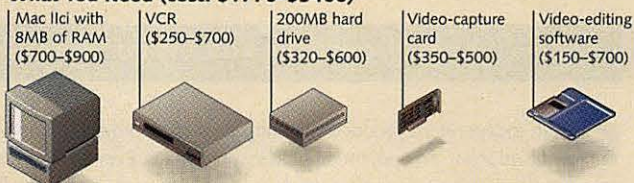
**Recommended Products** Software: VideoToolkit (Abbate Video, 508/376-3712).

### MULTIMEDIA VIDEO

#### Your Goal

To get video footage into a Mac for use in multimedia presentations or for creating CD-ROMs. (You don't need full-screen 30-fps video. You don't need to output the finished product to videotape.)

#### What You Need (cost: \$1770-\$3400)



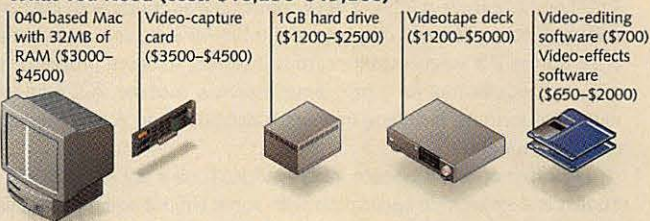
**Recommended Products** Hardware: MovieMovie (Sigma Designs, 510/770-0100) or VideoSpigot (SuperMac, 408/541-6100). Software: QuickFlix (VideoFusion, 419/891-1090), VideoShop (Avid Technology, 508/640-6789), or Adobe Premiere (Adobe Systems, 415/961-4400).

### CORPORATE VIDEO AND EFFECTS

#### Your Goal

To use your Mac to produce videotapes with titles, sound, and special visual effects for use in training tapes, presentations, proposals, or other work requiring just moderate display quality.

#### What You Need (cost: \$10,250-\$19,200)



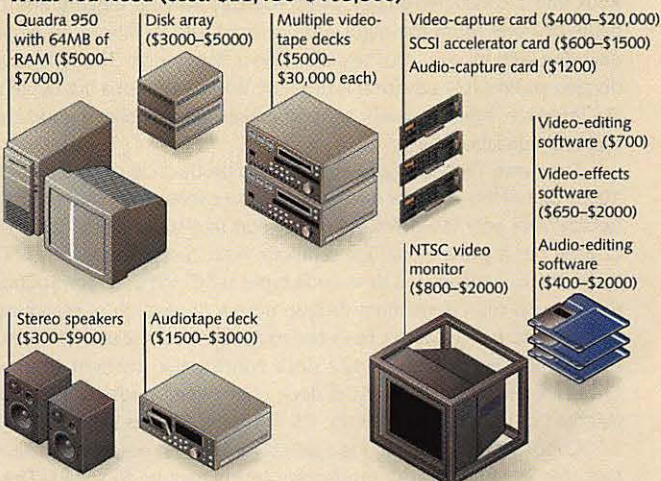
**Recommended Products** Hardware: VideoVision Studio (Radius, 408/434-1010) or MoviePak2 Pro Suite (RasterOps, 801/785-5750). Software: VideoFusion (VideoFusion, 419/891-1090) or After Effects (CoSA, 401/831-2672).

### OFFLINE BROADCAST VIDEO

#### Your Goal

To produce programs, with a Mac-based system, for broadcast television. You need to control multiple audio and video sources while maintaining the high quality of those sources. You also need to see the results of your edits and special effects immediately, since you have large amounts of footage and a very tight deadline.

#### What You Need (cost: \$28,150-\$105,300)



**Recommended Products** Systems: Media Composer 400s (Avid Technology, 508/640-6789), Media 100 (Data Translation, 508/460-1600), or VideoCube (ImMix, 916/272-9800).



example, split edits—transitions where audio from a clip comes in before the picture—are technically possible but not easy to manage in Premiere. Also, Premiere offers no simple methods for relocating audio sync after its link with the picture is broken.

Moreover, Premiere's playback accuracy and time-code addressing are often inconsistent, due to some frame-addressing anomalies within the application and to data bottlenecks in communicating with the compression hardware.

Still, the addition of time-code support in Premiere has at least made offline editing possible. When used with a video-

tape recorder's control plug-in such as Abbate Video's VideoToolkit Plug In Pack (\$99, 508/376-3712) or Pipeline Digital's ProVtr (\$99, 808/235-0335), Premiere even supports batch digitizing with RS-422 serial port-compatible control and time-code capture for videotape recorders (in either SMPTE format for North America or EBU for Europe). This feature is important if you later want to export an edit list and assemble an edited master at an online editing facility.

Although Premiere is not ready for prime time from a professional-editing standpoint, it certainly has taken some of the mystery away from postproduction,

and it has exposed more people to basic video-editing concepts than any other mass-market product.

**Special effects** Premiere really shines when creating effects. Its plug-in architecture offers ever-expanding possibilities for producing exciting digital video effects. When used with either CoSA's After Effects (401/831-2672; version 2.0 costs \$1995; version 1.1 is bundled with Digital Film) or VideoFusion's VideoFusion (bundled with VideoVision Studio; \$649; 419/891-1090), any one of the JPEG cards is transformed into a resolution-independent video-effects workstation featuring complex rotoscoping tools, traveling mattes, alpha-channel compositing, multiple layering, filtering, and image distortion. All three effects packages introduce subpixel motion and field rendering, which smooths out a lot of the sizzling problems associated with swift movements in computer animation.

CoSA has increased the precision of the image and motion controls in After Effects 2.0, letting the user compose animation and effects as a sum of composited image layers; the layers can all be matted, filtered, and altered independently with a powerful keyframe interface.

VideoFusion has a gentler learning curve, but it deals only with two images and one effect procedure at a time. It does, however, sport some unique effects, such as dynamic morphing, flex-warping, and time-based filter controls. VideoFusion also has fast thumbnail-image previewing, which lets you quickly set up effect parameters and get immediate feedback.

Even though After Effects seems to be aimed at advanced users and VideoFusion positioned as an entry-level product, I recommend both packages together as complementary production tools, despite the fact that some features overlap.

The only downside to all this digital manipulation is the rendering time involved in building an effect. Even on a Quadra 950, certain Premiere transitions can take 20 to 30 minutes to render; and a 10-second After Effects project using some rotation and multiple filters can take many hours. While this kind of rendering time is perhaps tolerable in multimedia production (where the total amount of motion video is relatively small), most video postproduction work demands even faster turnaround.

VideoFusion now supports Yarc Systems' NuSprint graphics accelerator card (\$2495, 805/499-9444), which increases performance up to 300 percent. CoSA is also working on better rendering strategies. But for the time being, unless more time than money is available, most professional effects will continue to be pro-

## BEST OPTIONS FOR VIDEO LOGGING

**F**or an independent producer working project to project, a costly investment in postproduction equipment may be inappropriate. Even so, there are still ways to save time and money no matter what production environment you find yourself in.

As the shift to nonlinear digital editing progresses, the need for good logging and shot-organizing habits becomes more critical. Efficient logging saves you time in the editing room, and since you identify unnecessary footage before you digitize, you also save valuable disk space.

One such low-cost productivity tool is Pipeline Digital's AutoLog (\$195, 808/235-0335), the full-featured version of the ProVtr plug-in for Adobe Premiere. AutoLog has excellent RS-422 deck control and supports both EBU and SMPTE time codes. AutoLog formats clips into a text file—it will even capture thumbnail reference frames if a video-capture card is installed. Its word processor style has made it a very popular tool for transcribing interview footage. AutoLog exports logs in a variety of formats, including ImMix's VideoCube and Avid's Media Composer, for easy batch-digitizing.

Another option is Abbate Video's VideoToolkit (\$279, 508/376-3712). VideoToolkit is a smart little application with some limited editing capabilities. It runs on almost any Mac and can control an extremely wide range of professional and non-professional video decks (even camcorders). With a digitizing board it even supports QuickTime, giving the program some of the editing functionality of Adobe Premiere at less than half the price.

Organizing and logging material is the first critical phase of postproduction, and VideoToolkit lets you accomplish this task with nothing more than a PowerBook and a consumer-quality VCR. You can do your logging and organizing in a plane or hotel room the night after a shoot and walk into an editing session the next day with all your shot selections on a floppy disk. The time saved in one production could easily pay for this product. While I am not a big fan of its HyperCard-like interface, the broad deck support makes VideoToolkit a good choice for industrial and educational use.

Sundance Technology Group makes a product called Q-Base (\$675, 214/869-1002) that offers stronger on-board database features than the other two products (which offer only tab-delimited text export to a stand-alone database application). Q-Base has a professional job template with customizable fields. The application keeps track of media and time-code types (LTC, VITC, or control track) in addition to the usual clip information. Q-Base does a decent job of searching multiple logs to find clips, but it doesn't have the multiparameter search features of most database applications. The RS-422 deck control also seemed somewhat sluggish. Q-base does support the ADB deck controllers made by JLCopier Electronics (Media Control Station \$269.95; CS-1 Control Station \$499.95; 310/306-4131).

Choosing the right logging application for your needs could be the first important step in bringing your production techniques up to speed. The first time you find a critical close-up in a mouse-click, rather than in panicked searching through hours of footage, you'll wonder how you ever worked any other way.



duced on higher-end, dedicated machines even at their exponentially higher cost.

## Corporate Video

Companies seeking to produce in-house videotapes, or agencies seeking to create good-quality proposals and comps, can select from several professional-quality production facilities built around a Mac engine. These systems tend to be expensive from a typical computer user's viewpoint, but they're much cheaper than traditional video-editing systems.

**Avid options** The Media Suite Pro from Avid Technology (\$9995, 508/640-6789) is a bundling of a NuVista+ JPEG card, an Audiomeia II card, and an ATTO Technology SiliconExpress SCSI-2 card with Avid's highly regarded editing interface, excellent trim functions, digital/analog audio scrub, and shot organization features. It has a loyal legion of editors humming sweet songs of praise.

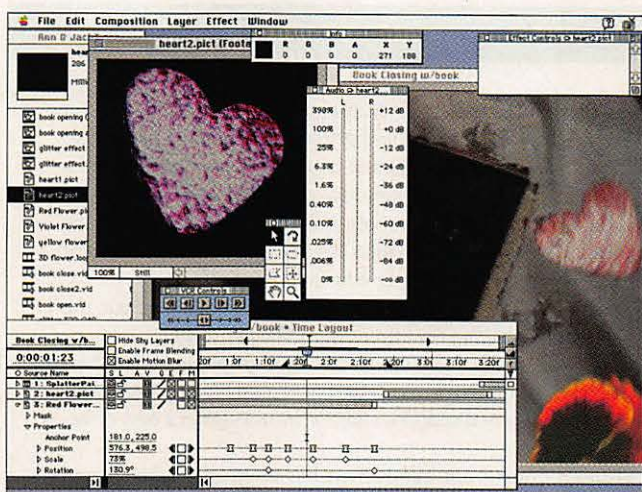
Media Suite Pro's trim mode visually opens up the edit point, so that the editor can add or subtract frames while having constant visual feedback on how the end frames fit together. This feature makes it a pleasure to cut matching action.

Media Suite Pro is designed to edit nonbroadcast projects (such as corporate and promotional materials) from start to finish, exporting the final piece directly to tape. It supports A/B transitions and such effects as picture-in-a-picture and slow motion, it lets you edit four CD-quality audio tracks separately or locked in sync, and it fully automates the reestablishment of broken audio sync.

Media Suite Pro also has proprietary AVR5 (30-field) and AVR25 (60-field) image compression. The image quality is clean enough for most industrial use.

The recent addition of an EDL option (\$995) makes Media Suite Pro viable as an offline system, although some of the most useful editing features found in the higher-end Avid systems are unfortunately missing. For example, the time line uses only keystroke commands, while almost every competing interface (including Avid's own Composer 5.0 software) also lets the user move clips around with the mouse. The lack of draggable clips seems peculiar, considering that the product is aimed at a less-sophisticated market that might prefer to work with clips graphically rather than with frame counts and in/out points.

A true offline system at the same price point is Avid's Media Composer 400s (\$14,995). Running on a Mac IIci or better, the 400s is an entry point to Avid's popular Composer product line and is suited for most kinds of long- and short-format editing (such as music videos, doc-



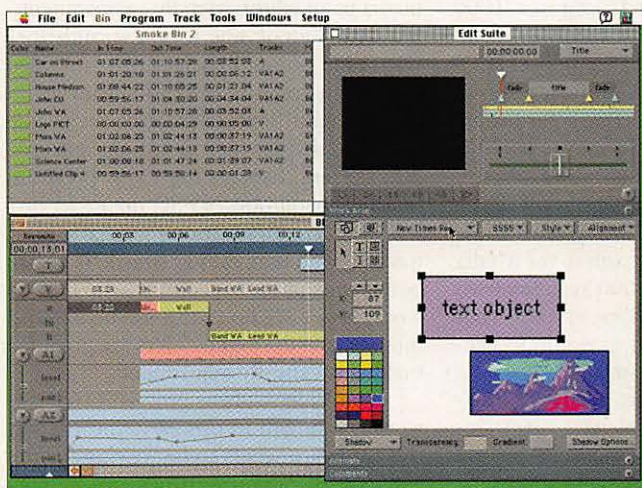
## Precision Effects

CoSA's After Effects 2.0 has expanded the precision and power of its 2-D animation and effects. The number of tools and elements available on screen means that After Effects works best in a dual-monitor configuration.



## Multiple Images

Version 5.0 of Avid Media Composer's software offers tools to control the display of windows within the video image, including settings for the windows' borders. Each window has its own time line, or track.



## Video Titling

Data Translation's Media 100 offers text tools for placing words and illustrations over the video—useful for adding captions or subtitles.

umentaries, commercials, and features). The basic configuration supports only AVR1 video compression (30 fields per second of low-resolution images). This means lower picture quality, albeit much smaller storage requirements: up to four hours fit on a 2.2GB drive. Beyond the core Avid editing features, the 400s offers EDL support and handles up to four

video tracks for mixing complex images. Another distinction is that the Media Composer series provides a modular upgrade path, while the Media Suite Pro does not. For \$4000 to \$5000 per module, you can add such features as 24 tracks of audio or AVR2 video compression. The deluxe offline system is Avid's Media Composer 800 (\$49,995), which



## THE LINEAR ALTERNATIVE

**W**hile nonlinear editing systems have been grabbing all the postproduction limelight of late, linear systems and hybrid systems will continue to have an important role for some time. To this end, a German company called Fast Electronics U. S. (508/655-3278) has created an important low-cost solution for lower-end professionals. Starting at \$4995 (the studio version is \$6995), the Video Machine is similar to NewTek's popular Amiga-based Video Toaster. The Fast machine provides high-quality analog switching with editing and shot management.

Although the software (version 1.0) could lose some clutter in its interface, the openness of the system should make it very attractive to Macintosh users. In many ways, the Video Machine is what the short-lived Video F/X system made by Digital F/X should have been: it offers on-board time-based correctors, dual-frame buffering, six video inputs, multiformat support, and Y/C in/out—all in a cost-effective package.

In a radical departure from current trends, Fast has omitted character- and graphics-generating modules, opting instead to let users choose applications (such as Photoshop, Premiere, or Painter) for creating graphics. You can even design your own custom wipes (a CD-ROM containing many examples comes with the Video Machine) and bring them into the system.

Fast is also working on a nonlinear component to the Video Machine that promises to further enhance its flexibility. Keep watching this rapidly evolving product.

supports AVR1e through AVR3e compression (the *e* stands for enhanced compression ratio). The 800 comes complete with a Quadra 950, two 14-inch multisync monitors, Roland speakers, and a 2GB hard drive. In addition to the standard Avid features, the 800 supports more special effects and motion effects, interlocked footage grouping for multicamera editing, and 24-track audio.

The other members of Avid's Composer line are the Film Composer (\$69,995), the Media Composer 1000 (\$49,995), the Media Composer 4000 (\$75,995), and the Media Composer 8000 (\$89,995). The Film Composer allows 24-fps editing and generates a cut list for negatives; the Media Composer 1000 is Avid's midrange offline/online system, positioned to compete against some of the lower-cost high-resolution systems while maintaining an upgrade path to the Media Composer 4000 and 8000 systems (two full-featured digital online systems that use 60-field AVR25 compression to preserve the highest image quality).

**Real time, real value** Britain's Carlton Communications plc is no stranger to video; it owns several high-profile companies, including graphics innovator Quantel and analog-editing giant Grass Valley Systems. Carlton's foray into digital video has produced the ImMix VideoCube (\$40,500; 916/272-9800), an online, nonlinear workstation that uses a Macintosh as a front end.

ImMix engineers have solved some of the daunting data-compression and throughput hurdles by bypassing the Mac entirely and using a proprietary RISC-

based processing unit to crunch numbers at staggering speed. The VideoCube comes complete with video processor, storage module (enough for one hour of video and two hours of CD audio), speakers, and Quadra 650.

The result is the first truly high-quality, real-time effects processing at a price that most professionals will find very affordable. Relieved of the burden of pushing around all that video data, the Mac is free to do what it does best: manage the media in an editor-friendly environment.

The VideoCube uses a straightforward time-line approach—with one video track, one graphics track, and four audio tracks—with floating palettes for all the audio- and video-processing parameters. The system displays the video program as a full-resolution NTSC image so that the user can always monitor final output quality. The manual jog shuttle is a nice bonus for traditional editors (who tend to work faster without the keyboard and mouse), and the audio faders are great for making on-the-fly adjustments.

The VideoCube is powerful and easy to use, although in this early incarnation the hardware seems to be waiting for the software to catch up. It has a nice split-screen trim option, but the time line lacks some finesse; for example, it doesn't offer multiple video tracks or stronger split-edit support. Also, a second offline resolution option (like what Avid's Media Composer 1000 offers) would make the system amenable to a wider variety of editing situations. A more graceful keyframe system for audio mixing and effects would also be welcome.

The VideoCube's proprietary media-storage modules (\$5000 per module) mean the cost per minute of storage is higher than the market rate—a tough swallow for the Mac hack used to choosing among several hard drive manufacturers.

**Budget online** The dark horse to watch in this pack is Data Translation's Media 100 (\$11,995; 508/460-1600). Although the product is fairly new, its price/performance analysis was very impressive in my testing, despite some shortcomings. The Media 100 is a two-card solution that offers four tracks of 16-bit audio and 60-field image quality that rivals that of the VideoCube.

The Media 100 implements optional support for Adobe Premiere plug-in effects technology, with some on-board acceleration to reduce rendering times (the effects option costs \$995). The interface uses the multitrack time-line approach and source-bin metaphors common to most of the systems previously mentioned; but the Media 100's time-line interface benefits by always being in WYSIWYG mode, and its editor works with a full-screen, high-quality image on an NTSC monitor. These features go a long way toward making nonlinear editing a transparent experience for the editor's clients: all they know is that their program is being assembled very, very quickly.

The Media 100 has keyframe audio settings modeled after Adobe Premiere's so you can do sophisticated audio mixing right on the time line. The Media 100 also supports various digital resolutions within the same program—a useful feature that neither Avid nor ImMix has yet implemented. With multiple resolutions, the editor can work in a low-resolution offline mode but can digitize particular shots—wide vistas, for example—at higher resolution when detail is important. Offline use is more practical with the EDL option (\$995), but the version I used produced erratic results.

Although the Media 100's layout is very approachable and easy to navigate, some precision-trim features are lacking. For example, the absence of any strategy for split-screen cutting makes matching action laborious, and the inability to edit using time lines (in analog editing, record time codes) in trim mode and the lack of auto-resync limit the 100's flexibility.

The Media 100 supports QuickTime better than other systems do. Another feature that will appeal to Mac-savvy bargain hunters is the flexibility of the storage media. The Media 100 will run with a variety of economical, off-the-shelf SCSI drives, as long as they have a sustained data throughput of 3MB per second and an access time of 11ms or better.



## From Disk to Airwaves

The difference between what is broadcastable (that is, legal under the Federal Communications Commission's RS-170A rules) and what is of professional studio quality is complicated. Broadcast producers ultimately expect a finished product with the most pristine image possible. Moreover, professional video engineers and the FCC are a picky lot. Walk into a TV station with a program produced directly from disk and you'll get a lecture in a seemingly foreign tongue about IREs, vertical blanking, subcarrier phase, and graticule amplitude—an ancient, analog lexicon that predates computer jargon.

Even at 60 fields per second, most of the systems covered in this article are not ready to handle the exacting standards of most commercial broadcast work—although that day is rapidly approaching. Today, Avid Technology's Media Composer 4000 and 8000 systems come the closest to meeting that high standard. For now, nonlinear online material is largely coming in through the back door—promos, infomercials, and other short-form work. But time-sensitive programming like news and sports are beginning to turn to Macintosh-based nonlinear solutions to meet their tight deadlines. Within a year or two, improvements in image quality and in media storage should be available to satisfy even the most demanding professionals.

The benefits of a complete Mac-based postproduction facility are many. The possibility of seamlessly combining audio, animation, graphics, text, and effects with video sources in a Macintosh environment is one attraction. This is certainly the vision implied by the Avid-led (and VideoFusion-supported) push to define an industry-standard Open Media Framework Interchange (OMFI) that not only provides protocols for porting various types of digital media among applications, but also includes descriptive data that represents how the media is organized and how a program is to be played. Using inexpensive networking technology, extremely fluid and efficient postproduction environments could be created, whereby projects flow from different workstations without ever leaving the digital nest. However, until the industry hammers out a true standard—be it OMFI or something else—QuickTime remains the de facto digital video conduit on the Mac.

Another attraction to Mac-based postproduction is economy. An integrated nonlinear online system costing between \$100,000 and \$200,000 can be more versatile and efficient than tradi-

tional analog setups that cost upwards of \$500,000.

## Making a Choice

Right now, choosing the Macintosh platform for video production work means bearing with some evolving technology. A Mac system may cost more up front than an Amiga- or PC-based product (such as NewTek's Video Toaster, TouchVision's D/Vision, or EMC's Primetime Editor). But the payoffs are usually more-versatile product features; compatibility with a large, existing base of graphics and animation software; and in several cases, a superior interface.

For multimedia, the Mac is definitely the place to be, and producers have already discovered the benefits of relatively inexpensive JPEG compression cards.

For offline video postproduction, some real breakthrough products have been established, and more are on the way. The online solutions aren't as mature, but many corporate and industrial producers can't afford to wait.

For a multimedia company or an advertising agency roughing out ideas, a lower-priced JPEG card with Adobe Premiere may be completely adequate. A budget-minded documentary filmmaker will probably be happy with the flexibility of the Media 100. A large postproduction house might want to invest in various models in Avid's Composer line to maintain maximum compatibility, while a smaller postproduction facility, production company, or corporate-media department might be interested in the versatility and price of the VideoCube.

The best advice is the same given in any technology-intensive endeavor: stay modular, keep the upgrade path open, and maintain compatibility with established industry standards. Make sure you have adequate methods of getting your work back out to a variety of formats with minimum hassle. And make sure you have the storage capacity and horsepower to work effectively. Nothing will be gained by forcing a Mac IIci to process a special effect at film resolution. On the other hand, a PowerPC-based Macintosh may not be necessary to do low-resolution offline editing for cuts only. (Also note that most video-editing hardware vendors seem to be waiting for the second generation of Power Macs before adapting their products.)

While it may never truly become the video equivalent of PostScript in the desktop publishing world, QuickTime certainly has given birth to a more elastic media paradigm and opened a wide frontier. Traversing that vast territory is a challenge requiring fluency in both video

and computer dialects. One thing is certain: just as Edison's infant kinetoscope matured into the motion-picture industry, we can count on the toddler QuickTime (the modern-day equivalent of the kinetoscope) giving way to enormous technological advances and the growth of a major industry. Growing pains aside, the future looks to be a wild ride on the crest of the telecommunications wave. **m**

AVI HOFFER, who writes frequently about Mac-based video-editing systems, runs Red Herring Pictures, a postproduction house in Hollywood.

Additional reporting by JIM FEELEY.

## PROFESSIONAL VIDEO EDITING



Because there are several distinct markets for video-editing tools, we chose the top products for each of those markets. To select the best, we focused on high-quality output and ease of use. Because broadcast-quality tools are just emerging, we have no Editors' Choice in that category.

### Presentation Video

**VideoVision Studio** While other systems have a component or two that are better than those in VideoVision Studio, this Radius system delivers the best image quality overall and has a strong set of tools for capture, effects, and output.  
**Company:** Radius. **List price:** \$4499.

**MoviePak2 Pro Suite** This set of products offers high image quality. By substituting a MediaTime board for the suite's video card, you also get 16-bit audio support.  
**Company:** RasterOps. **List price:** \$4199.

### Corporate Video (Offline)

**Media Composer 400s** A good, core system, the 400s offers support for complex image mixing. Its modularity means it can be upgraded to Avid's higher-end video-production systems. **Company:** Avid Technology. **List price:** \$14,995 (excluding cost of Mac).

### Corporate Video (Online)

**VideoCube** Using a Quadra as the front end gives this system the horsepower to do professional work while offering the ease of use of a graphical interface. But beware the proprietary storage modules: they're expensive. **Company:** ImMix. **List price:** \$40,500.



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# Video Production

TIPS FOR CREATING TOP-NOTCH QUICKTIME VIDEOS

# Technique

Since its introduction in 1991, QuickTime video has been a featured Mac attraction. The list of products for capturing, editing, and adding special effects to video has grown to number in the hundreds. Used effectively, QuickTime video can add an element of interest to a presentation, offer real-world examples in a training application, or in some cases provide a replacement for tape-based video.

Whether you're editing a full-motion, full-screen feature film or a postage-stamp-size window on the world, you can take advantage of production and editing techniques that make your work easier and make your results more professional looking.

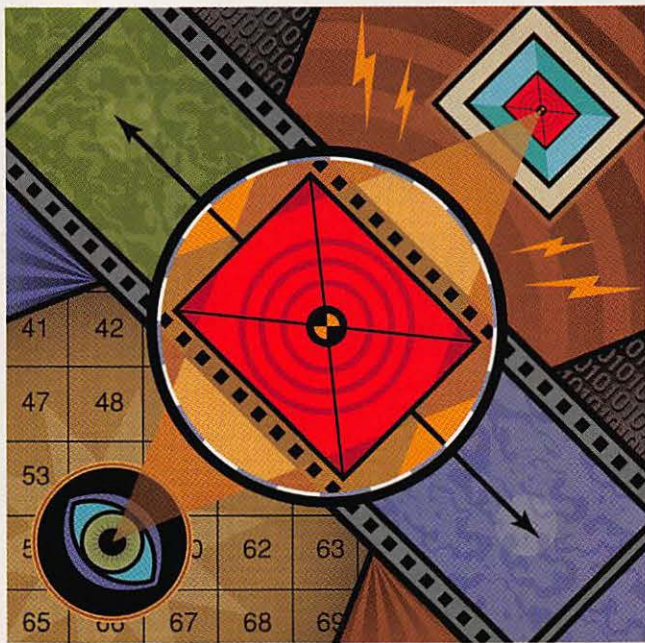
To show you these techniques, I will use examples from Adobe Premiere version 3.0 from Adobe Systems (415/961-4400) as the video-editing software. This latest version of the popular Premiere adds several new features and enhancements, including support for third-party hardware accelerators for movie previews. For video capture and output, I used the Editing Aces Suite from RasterOps (801/785-5750), which in-

cludes a MediaTime card, a MoviePak JPEG accelerator daughtercard, and a Video Expander II breakout box for NTSC video output. This package allows real-time video capture and playback with 16-bit CD-quality stereo audio. The card set captures a 320-by-240-pixel image at 30 fields per second, which is good enough for most on-screen video and for many videotape presentations. (Editing Aces was recently discontinued. The feature "Video-Editing Tools," in this issue, evaluates its successor and the range of video-production products.)

Whatever products you use, you'll find the following step-by-step techniques helpful in producing top-quality video effectively.

## Preview Your Source Material

- **Make a story line** Start by previewing your source material and roughing out a story line. It's an old and oft-repeated suggestion that you should plan your production, and for a good reason: every story needs a beginning, middle, and end. Make sure you've got an idea of what material you'll use for each of these elements.



- **Check your drive space**

Also make sure you've got sufficient hard drive space for the material you'll be digitizing. Running a test early, to gauge the storage requirements that your video hardware and software will demand, can prevent a "disk full" alert while you're on deadline later.

- **Log segment positions** If you're using consumer video equipment to capture your source material, note the tape-

counter positions for each segment so you can find them later. If you're using more than one source tape, number each one and log that number in your notes.

## Capture Your Video

- **Capture more than you need** Start capturing the images before the beginning of each logged tape-counter position to ensure that you get all of your segment. You'll edit the



BY MATTHEW LEEDS

# UES

start and end points later.

**Expert technique** With professional gear, you can take advantage of machine control and time coding to grab just the segments you want. But you may want to grab more at the beginning and end and edit it later, particularly if you plan to use split edits.

• **Check capture quality** Once you've digitized your clips, preview them. Check for dropouts, frame glitches, stutters, or other problems (see the screen image "Movie Analysis"). In Premiere, use the movie-analysis tool to check the average frame rate and to see if any frames have been dropped.

**Expert technique** You can cure dropouts by exporting the frame segments with dropouts as Filmstrips, re-touching them in Adobe Photoshop, and then importing them back into Premiere. If a video-player head clog or massive dropout has trashed a frame, use Premiere's razor tool to cut that frame out and then export the frame just before the damaged frame as a PICT file. Then import the PICT image back in, set its frame rate to  $\frac{1}{30}$  second, and insert it where the damaged

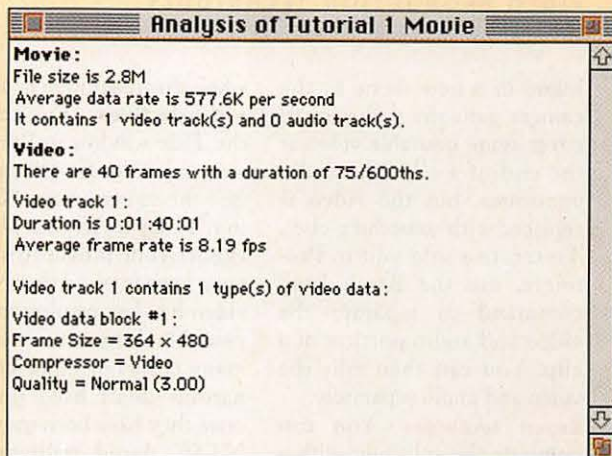
frame was, as the screen image "Fixing Dropouts" shows.

## Piecing Together Clips

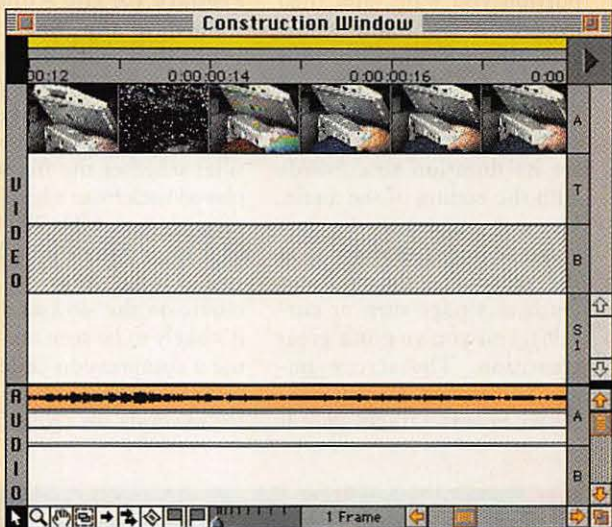
• **Plan for transitions** As you preview each clip, think about its starting and ending point. In Premiere, you can trim your in and out points accurately using either the scrub wheel in the Clip window or the left- and right-arrow keys on the keyboard (see the screen image "Clip Trims").

Also, think about how you're going to get from the end of one clip to the start of the next. What kind of transition will you use: straight cut (an abrupt change from one clip to the next), some kind of wipe or fade, or another technique? Watching television for the production techniques used can give you a good background. Notice how most of the transitions are straight cuts. Overusing wipes and fades is the desktop video equivalent of using 30 fonts in a newsletter.

**Expert technique** One reasonably subtle technique is the split edit. This is an edit where the audio and video don't make the transition at the same time. It's great for voice-overs, or for starting the dia-



**Movie Analysis** Premiere's movie-analysis feature provides valuable information. For example, here it shows that the movie would not play well from a CD even though it plays at just 8 frames per second, because its data rate exceeds the 300K-per-second limitation of a double-speed CD player.



**Fixing Dropouts** The second frame is glitched, most likely the result of a massive dropout on the videotape. Buy the best tape you can afford. Professional videotape offers fewer dropouts than consumer tape.



**Clip Trims** Use the scrub wheel to slowly step through your clips and find the exact edit point you want to use. The scrub wheel (the dial viewed edge-on) is on the left, just above the slider.



logue in a new scene as the camera pans the scene, or to cover some unusable video at the end of a clip (the audio continues, but the video is replaced with something else). To create a split edit in Premiere, use the Break Link command to separate the video and audio portion of a clip. You can then edit the video and audio separately.

**Expert technique** You can combine the split edit with a variant of the technique used to fix a damaged frame to add length to a video clip. Split a clip into video and audio, shorten the video to just the portion you want, and then export the last frame of the video as a PICT image. Now import that PICT image and add it to the end of the video segment (as a still frame), and set its duration to coincide with the ending of the audio. Use a transition to the next video segment that starts at the beginning of the still frame (such as a page turn or curtain), and you've got a great transition. The screen image "Advanced Transitions" shows how the tracks appear

when this technique is used.

- **Create titles** You can use the Title window in Premiere to create titles for your movie (see the screen image "Creating Titles"). If you plan to export your movie to videotape, keep in mind that NTSC video has less resolution than your Mac's monitor and that many colors or color combinations don't hold up well once they have been moved to NTSC. Avoid gradient fills, saturated colors, and some types of drop shadows. Again, TV may provide good examples of titles that work.

### Prepare for the Audience

- **Preview the final video** When your movie is finished, think about your viewing audience. If people will be viewing your creation on a Mac, consider whether the file will be played back from a hard drive, cartridge, or CD. The playback rates differ for each, and you should preview your movie on the slowest system it's likely to be seen on. Don't use a compression codec (the software coder/decoder used, for example, in QuickTime)

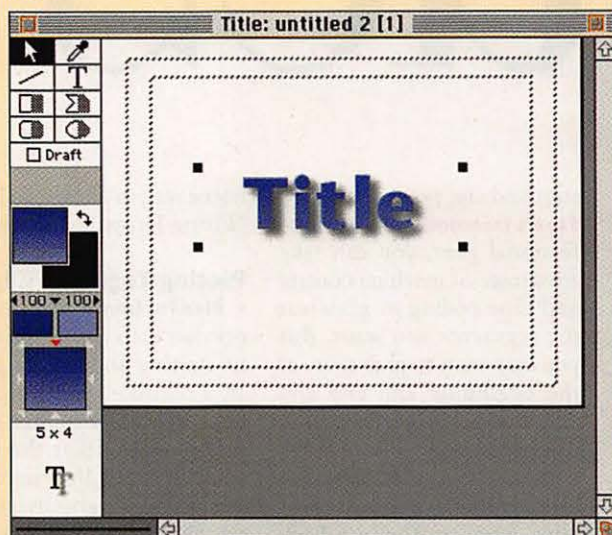
## RECOMMENDED QUICKTIME SETUP

It's hard to suggest a better video-editing setup than either the Quadra 660AV or 840AV. While neither offers 24-bit video capture, they both provide 16-bit audio capture, which is far more important in creating a perception of quality. Also, the new SCSI Manager provided with these machines improves their hard drive performance. Unless you're trying to do full-screen work (for which you also need a hardware compression board), you won't need a drive array.

On the video side, work with either Super VHS (SVHS) or Hi-8 tape formats. Both provide S-Video input and output (separate luminance and chroma) and much better resolution than standard VHS. For SVHS, Panasonic's AG-1970 videotape deck is deservedly popular (\$1375 street price; Panasonic Communications & Systems, 201/348-7000, 800/742-8086), and the new Sony EV-C100 Hi-8 deck is an excellent recording and playback deck with a very affordable price (below \$500 in stores; Sony Corporation of America, 201/368-9272, 800/222-7669). While it is not frame-accurate (so you can't accurately move to a specific frame for recording or playback), the EV-C100 does offer control-L machine control (a standard consumer-level control protocol), and third-party plug-ins let you control the EV-C100 from within Premiere.



**Advanced Transitions** The last frame on the Video A track (with the yellow dotted outline) is a still: a PICT file exported from the end of the clip and then imported back into the movie.



**Creating Titles** Premiere's title maker has all the basic features for creating titles. By using it with the special-effects filters, you can go far beyond this simple example.

that relies on hardware assistance unless you know that the same hardware will be available for playback.

**Expert technique** If you plan to use the CompactVideo codec (included with QuickTime 1.6), allow plenty of time for compressing in that format, since it takes much longer to compress than any other codec (although it does offer better playback rates). You might consider testing a portion of your movie compressed in that fashion first.

Producing great desktop video, just like desktop publishing, requires much more

than merely developing technical expertise with hardware and software tools. Take the time to study the techniques used in TV and movies. You can use a tape deck with a good slow-motion and freeze-frame capability to analyze the methods practiced by the pros (a laser disc player is even better). You might also browse the magazine section at your local newsstand or public library for publications dedicated to cinematic technique. ■

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Macworld, April 1994



MacUser, April 1994

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# BY CARLY LU

he overriding fear of most PowerBook users when they're on the road is that their battery will run out of power before they finish their work.

Advice on how to prolong PowerBook battery life abounds, much of it based on speculation rather than actual testing and measurements. To get definitive answers, Macworld Lab tested battery life under a variety of conditions to learn which steps really save power and which steps offer minor improvements or no improvement at all. Our tests simulate real-world use except in one area: we could not include sleep in the process, because our tests are automated through software for precise repeatability. (Once the PowerBook was in sleep mode, there would have been no way to wake it up.)

The results are in, and Macworld Lab found that only a few power-saving

more efficient power-management system, lower-power internal circuitry, and a better battery technology—nickel-metal-hydride (NiMH)—than the current PowerBooks, which use NiCad batteries.

If you've decided to buy a PowerBook based solely on power consumption and battery life, you would be disappointed in the PowerBook's overall performance. Every desirable PowerBook feature—faster processor, active matrix screen, color—requires more power. So if you choose the PowerBook with the longest possible battery life, you'll also get the PowerBook with the slowest processor and simplest screen.

## Power Theory 101

You don't need a degree in electrical engineering to prolong your PowerBook's battery life. However, you do

# POWERBOOK POWER MANAGEMENT

LEARN  
HOW TO  
SQUEEZE  
EVERY  
MINUTE OF  
BATTERY  
LIFE FROM  
YOUR  
POWERBOOK

methods have a major effect on battery life. There are many steps that save a modest amount of power, but some may not be worth the compromise in your PowerBook's performance.

Our tests showed good consistency in results among batteries of the same type, but remember that battery mileage varies. In fact, batteries vary more than any other computer component. Every individual battery is a little different in its construction and its usage history. Unlike the CPU or RAM, batteries wear out through normal use. The way you use your PowerBook and the age of your battery also play a role in battery life.

Macworld Lab tests are based on the PowerBook 145B and 180c, but the suggestions and power-management principles apply to all PowerBooks and PowerBook Duos. In general, the Duos have a longer battery life than comparable 100-series PowerBooks. The Duos have a

need a basic understanding of how your notebook uses power. I describe how much power various steps save on PowerBooks in milliamperes (ma). Amps measure the current or the flow rate of electricity; a milliamp is  $\frac{1}{1000}$  of an amp.

With all internal circuits except a modem running, here is the current consumption of three PowerBook models: PowerBook 145B, 1320ma; PowerBook 180, 1650ma; PowerBook 180c, 2370ma.

To make your battery last longer, you must reduce the amount of current the PowerBook draws. If you can reduce the current by 100ma, for example, you can add about nine minutes to the battery life of a PowerBook 145B, eight minutes to a 180, and five minutes to a 180c. The times vary among the PowerBooks because 100ma represents proportionately less current for a 180c than for a 180 or 145B.









## Power-Saving Strategies

Power-saving steps are executed in several ways. You can invoke some automatically by setting time delays through system software. If you don't want to wait for the automatic steps to kick in, you can manually invoke a power-saving step. You can control other steps through software or hardware choices. For example, save power by turning off AppleTalk. All the software descriptions given here are based on System 7.1 with PowerBook Control Panel 7.2. (To see how different power-saving features affect battery life, see "How Long Do Batteries Last?")

**Sleep** The best thing you can do to save power (aside from shutting down your PowerBook) is to put the machine in sleep mode. During sleep a PowerBook draws almost no power—only 6–10ma. Even in sleep mode, its RAM remains alive, so you don't have to be concerned

with losing the contents of your work.

- Choose Sleep from the Special menu in the Finder.

- Click on the sleep icon in the Battery control panel (if the icon isn't visible, click on the little flag at the right-hand end of the battery status bar).

- Use a PowerBook utility program. (For more on PowerBook utilities, see *PowerBook Notes*, *Macworld*, November 1993.)

I prefer a sleep F-key, which is quick and always available. However, this method requires practice: if you don't hit the sleep F-key just right, the computer records a double keystroke, immediately waking itself up again.

When you start using a PowerBook, before you put it to sleep you should save any new or changed data to the hard drive, just in case something goes awry later. But once you have established over time that your software is stable, you may

want to save the power you would lose to disk access and save less frequently. (I save my RAM disk files to the hard disk only every two or three days.)

You might be thinking, Why not save power by just shutting down the PowerBook when you're not using it? Starting up a PowerBook cold typically takes about 30 seconds, depending on the start-up configuration, and you still have to open a document. Waking a PowerBook from sleep takes about 4 seconds from a RAM disk. Even waking up a PowerBook from the hard drive takes no more than 15 seconds. Unless you won't be using it for several days, or you need to connect a peripheral or change batteries, there's no reason to shut off your PowerBook.

An inactive PowerBook goes to sleep automatically after a duration that you can set in the PowerBook control panel. Apple uses two minutes of inactivity



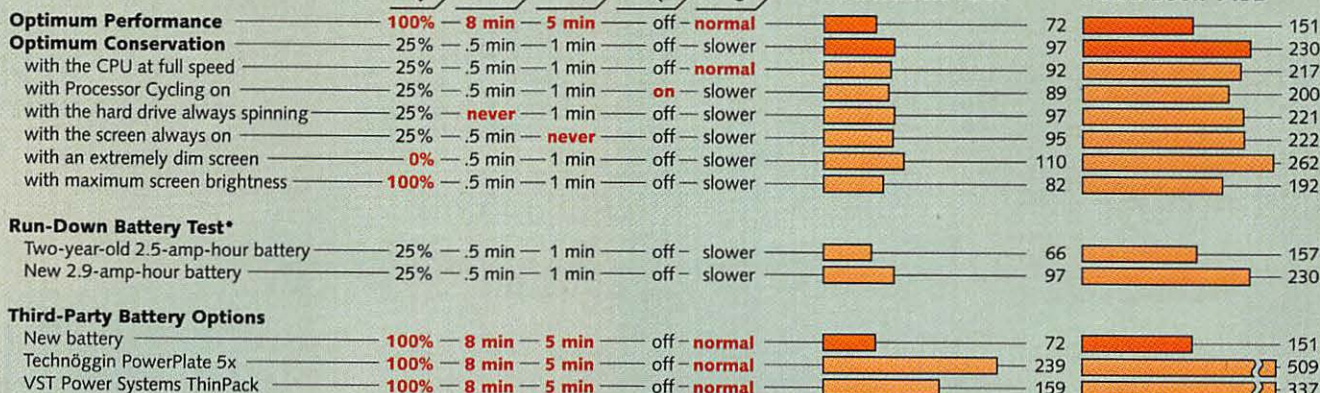
## How Long Do Batteries Last?

First we tested each PowerBook with settings that use the most power (Optimum Performance). Then we tested with settings that conserve the most power (Optimum Conservation). We added back each power-consuming feature to the Optimum Conservation setup, one at a time, to find out how each feature affected battery performance.

### OBSERVATIONS

- Running the processor at a reduced speed added only a few minutes of battery life.
- Enabling processor cycling proved more effective than reducing processor speed.
- Dimming the screen saves a significant amount of battery life.
- The hard drive doesn't consume as much power as we expected.
- For short intervals between disk accesses, the benefit of spinning down a hard disk is offset by the need to spin it up again.
- The 180c did not dim the screen as much or as frequently as the 145B.

Longer bars are better.  
Bars represent battery life in minutes.



\*With all major power-saving steps invoked (except for sleep). Both batteries are Apple products. The 2.5-amp-hour battery is discontinued. The order and part numbers for the 2.9-amp-hour battery are M5545/C and M5654, respectively.

### BEHIND OUR TESTS

To measure the real-world life of a battery, Macworld Lab wrote a set of QuickKeys macros to exercise different power-saving features of the PowerBook 180c and 145B. The macros launched applications such as Excel, Word, and FileMaker Pro and performed actual work within the applications. The macros simulated the way an actual user works: typing, pausing, and continuing to type. We didn't include any sleep time because the macros were unable to wake up the computer once it entered sleep mode. To measure the actual power consumption of ma-

jor components—hard drive, CPU, display, and so on—within the PowerBooks, we used MacAdios, a portable data-acquisition device from GW Instruments, and programming laboratory-instrumentation-design software called SuperScope II (GW Instruments). Macworld Lab also built a special adapter to tap inside the PowerBooks to connect to the data-acquisition device. All data collected by SuperScope II was then used to analyze the battery consumption of each computer component.

—Macworld Lab testing supervised by Mark Hurlow



before sleep as the default for battery operation. But if you are done with your work, you'll save battery life by putting the PowerBook to sleep right away.

Sleep is the most effective way to manage power, but a PowerBook will not go to sleep under any of the following conditions:

- You choose Stay Awake or Don't Rest in a control panel or from a PowerBook utility program.
- You have your PowerBook connected to a network.
- File sharing is on.
- AppleTalk is active on AC power.
- Apple Remote Access is running with the Answer Calls option on.
- An external monitor is connected.

Apple assumes that under these conditions you want to do something that requires at least intermittent CPU activity. Some utility programs can override Apple's settings that prohibit sleep under these conditions.

**Screen** The backlight takes more power than any other screen component. Even at minimum brightness, a PowerBook's backlight draws 200ma (monochrome) or 300ma (color); at maximum brightness, a backlight draws either 400ma (monochrome) or 900ma (color). Obviously, you should set the backlight brightness as low as possible and turn it off altogether when you have sufficient light. Under bright ambient light or in daylight, you can turn off the backlight altogether on a monochrome PowerBook. You can't do this with a color PowerBook because the screens are unreadable in bright light. The PowerBook control panel or a power-management utility can turn off the backlight automatically after a preset time—30 to 60 seconds works well.

Away from bright ambient light, you might want to shut off the backlighting at the same time system sleep kicks in. After all, if you can't see the screen, a wide-awake PowerBook doesn't do you much good. Setting the backlight to turn off before sleep mode kicks in does have one advantage, however: reactivating the backlight takes much less time than waking up the system.

Another part of power consumption applies only to active matrix displays, which have 256,000 transistors (monochrome) built into the screen, consuming a total of 105ma; or 921,600 transistors (color), which consume 380ma. These transistors, along with the screen driver circuits in all PowerBooks, can be turned off only with system sleep.

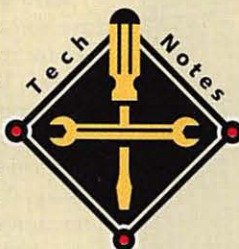
If your PowerBook has a color or gray-scale display, you will save only a minor amount of power by switching to

## FORGET ABOUT THE MEMORY EFFECT?

**W**hen NiCad batteries are partially discharged repeatedly, they suffer a voltage depression referred to as *memory effect*. The battery doesn't lose capacity; rather, the voltage output becomes depressed. Because the PowerBook always shuts down at the same voltage, the battery thinks it is capable of only that voltage, and the effect is shorter battery life. You can usually correct the problem with a deep discharge followed by a full charge. In problem cases, a battery may need two deep discharges.

You can perform a deep discharge by operating your PowerBook past all the low-power warnings until it shuts down by itself. For a little more discharge, leave the battery in the PowerBook and leave it turned on overnight before you connect the battery to a charger. Battery-conditioning accessories add another step—they automatically start the charging process after discharge; without a conditioner, you must connect a charger manually. A NiCad battery is good for about 500 recharge cycles, and a conditioner throws away a cycle each time you use it. So use a conditioner only when you can't restore battery capacity by ordinary charging.

The memory effect is real but not common. Sometimes the memory effect is confused with a worn-out battery. You would have to run through the same partial discharge many times for the memory effect to become a problem. (You would have to use the PowerBook for exactly 30 minutes, and then



recharge it, for example, dozens of times before your battery would suffer from memory effect.) Macworld Lab tested for the memory effect with the common situation of five and ten partial discharges. First, we operated a PowerBook 180c with

settings for optimum performance for 30 minutes and recharged it, repeating the sequence five times. After the fifth recharge, the battery ran for 65.3 minutes. Next we performed one deep discharge and recharge, after which the battery ran for slightly less time, 65 minutes. After a second deep discharge and recharge, the battery ran for 68.5 minutes. According to Macworld Lab tests, a 180c with a new battery ran for 72 minutes under the same settings.

For our second test, we started with a new battery. After ten 30-minute partial discharges followed by a recharge, this battery ran for 66.6 minutes. We then gave the battery one deep discharge and a recharge, and the battery ran for 68.8 minutes; after two deep discharges and a recharge, it lasted 70.1 minutes.

NiMH batteries suffer less than NiCads from memory problems, although Apple recommends a deep discharge once a month. The Duo 270c can perform a deep discharge and automatic recharge without any accessories, using Apple's Battery Recondition program. The lead-acid batteries of the PowerBook 100 and the third-party flat-pack batteries have no memory problem; fully discharging them causes permanent damage.

black-and-white. The computer will run a little faster, however, and therefore save you a little time. Similarly, setting the desktop pattern to all white does not save measurable power, but a white or nearly white desktop might encourage you to keep the backlight turned down.

**Processor cycling** Macintosh users' fascination with CPU performance seems strange when you realize that most of the time a CPU has nothing to do: it's waiting for you to do something—type a character, save a file, sort a database, and so on. PowerBooks normally take advantage of this downtime by cycling the CPU rapidly between run and rest states. When nothing happens for about a second, the

CPU goes into a rest state; after another half second, it wakes up and checks for activity. If there is no activity, it goes to rest again and repeats the cycle every half second or so until some activity occurs. Occasionally, a program that performs lengthy calculations without user input from the keyboard or trackball will slow down with processor cycling enabled. If you notice that calculations take longer than they should, you may want to switch off processor cycling.

The Processor Cycling control is in the PowerBook control panel in the Custom settings. Set Allow Processor Cycling in the control panel. (The Portable control panel in System 7.0.1 calls processor



MARK JOHANN



**External Batteries** The only way to get substantially longer battery life is to get a bigger battery. VST Power Systems (508/287-4600) and Technöggin (513/321-1777, 800/305-7936) sell the most popular external batteries for the PowerBook 100 to 180. Two-pound external flat lead-acid batteries extend operation 3 to 7 hours. Four-pound double-battery versions run twice as long. Flat-pack batteries work well when you stay in one place (on a transcontinental plane flight, for example), but the extra size and weight make them awkward to lug around. Pictured above are the VST ThinPak (\$199.95) and the Technöggin PowerPlate 5x (\$299.95).

cycling System Rest.) If you can't see the control, hold down the option key when you flip the switch from Easy to Custom. Switching on processor cycling puts a 68030 CPU and its associated circuits to rest, saving 450ma of current on average, a major reduction. Processor cycling also turns off the floating-point unit (FPU), if present, for an 030 CPU, saving another 30ma. Some PowerBook utility programs can change the duration of delay before cycling; however, the PowerBook's de-

fault setting is optimal for most users, so you shouldn't make any changes unless you have a specific reason.

**Hard drive** In typical use, the hard drive consumes surprisingly little power, because it spends most of the time on standby. While spinning, the disk does draw significant power—typically 320ma, another 80ma during reading and writing, and an additional 40ma when the head is seeking. Typical head-seeks last for only a fraction of a second. Most applications don't demand sustained head-seeks, but some database managers do during sorting. When the hard drive is not in use (that is, when it stops spinning), it consumes only 40ma.

The PowerBook control panel puts the hard disk on standby automatically after one minute (the default setting). If you know you won't need your PowerBook for a while, you can spin down the hard disk immediately using an F-key. But once the hard disk has spun down, it takes time (5 to 8 seconds) and considerable power (1000ma) to spin the disk up again.

**Modem** A PowerBook turns on a modem only when a communications or fax program is running, so simply installing a modem does not add to the power load. Once it's on, however, a modem draws 110ma to 150ma. You should always remember to quit any communications or fax program when you're not using it. Sometimes a fax program puts something into the System Folder that leaves the modem turned on. Check carefully any software that uses the modem for automatic-answer features.

A modem's power consumption does not vary significantly with its operating speed; that is, a 2400-bps modem uses

about the same amount of power as a 14.4-Kbps modem. Of course, faster speeds minimize the time that the modem must be on and save power indirectly.

**AppleTalk** If you are not connected to a network, turn off AppleTalk in the Chooser or via a utility program. The AppleTalk circuitry itself draws only 10ma. The power culprit is the CPU, which will not stay at rest with AppleTalk turned on; the CPU and associated circuits actually run a third of the time to monitor network activity. That 33 percent CPU duty cycle burns power, an average of 150ma. With AppleTalk turned off, a PowerBook also wakes up a couple seconds faster.

**Limiting processor speed** Another way to save power is to limit the speed of the processor. Note that this is different than processor cycling. PowerBooks (both 25MHz and 33MHz) can be reduced to a speed limit of 16MHz. Reducing the speed saves only 90ma to 120ma, however, and processor cycling must be turned on to achieve those savings. Performance suffers, although the degradation may not be intrusive with many applications. In Macworld Lab tests, a PowerBook 145B at 16MHz ran for 230 minutes, compared with 217 minutes at 25MHz. (All other power conservation options were also in place.) A 180c ran at 16MHz for 97 minutes, compared with 92 minutes at 33MHz. You may not find about 5 percent longer battery life worth the slower performance.

**RAM disk** In theory, a RAM disk saves some power by reducing or eliminating the need for a hard drive. In practice, however, it doesn't work that way. If your RAM disk contains only applications

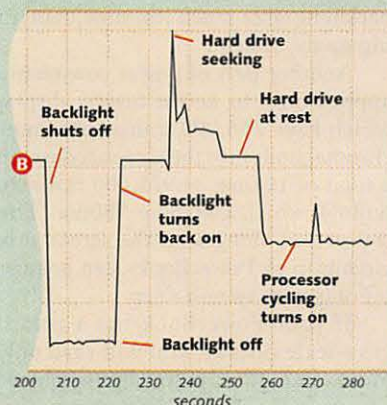


## Measuring the Power Flow

To determine the amount of power consumed by the PowerBook 180c's CPU, hard drive, and screen backlight, we used GW Instruments' SuperScope II to measure changes in power consumption when various power-management features were implemented. As the measurements show, power consumption varies constantly; this is especially true immediately after a PowerBook is turned on.

- A**
- PowerBook is turned on.
  - Hard drive spins up.
  - System performs memory check and transfers data (for example, loads INITs).
  - Screen and backlight activate and stabilize.

- B**
- CPU at regular speed.
  - Processor cycling off.
  - Hard drive asleep.
  - Backlight on.





# Power-Saving Techniques

Power-Saving Steps	When to Do It	How to Do It	Approximate Savings	Disadvantages
<b>The big four</b>				
Turn on processor cycling	always, unless you notice that calculations are slow	set Allow Processor Cycling in PowerBook control panel (automatic control only)	450ma (average); 480ma if FPU present	occasionally slows PowerBook performance
Reduce or shut down backlight	with sufficient ambient light	adjust backlight control next to screen; set Screen Dims in PowerBook control panel (automatic or manual)	200ma–600ma (dim); 400ma–900ma (off)	harder to see screen
Set hard disk to spin down	when hard disk not needed	set Hard Disk Spins Down in PowerBook control panel or a PowerBook utility program (automatic or manual)	150ma–250ma	hard disk needs 5–6 seconds and uses considerable power to restart
Set system to sleep	during periods of inactivity	set System Sleeps in PowerBook control panel, use a PowerBook utility program, or choose Sleep from Special menu in the Finder (automatic or manual)	1300ma–2200ma	can't use your PowerBook
<b>Three secondary steps</b>				
Turn off modem	when you are not using communications or fax software	quit communications program	110ma–150ma	can't communicate or send/receive faxes
Turn off AppleTalk	when you're not connected to an AppleTalk network or printer	set Inactive in Chooser or use a PowerBook utility program	150ma	can't access an AppleTalk network
Slow processor to 16MHz	when processing speed is unimportant	set Reduced processor speed in PowerBook control panel (to make setting visible, hold down option key while clicking on the Easy/Custom switch)	90ma–120ma	some applications may perform noticeably slower
<b>Three minor steps</b>				
Use black-and-white screen (don't use grays or color)	when grays or color are not essential to your work	set Black & White in Monitors control panel	minor; speeds video performance	less attractive screen; can't view color images
Save files infrequently	as infrequently as you feel comfortable	manual control or automatic saving utility	minor	risk losing data
Turn off sound	when sound is not necessary	set built-in volume to minimum in Sound control panel (menu bar will flash in lieu of alert)	minor	can't hear cool Mac sounds

and files, your hard drive still has to come on for system functions such as fonts and file management. You can create a self-sufficient RAM disk complete with a System Folder, but only the PowerBook 100 (discontinued in 1992) can handle a RAM disk gracefully. On the 100, the RAM disk remains alive even after you shut down the computer. On all other PowerBooks, you lose the RAM disk when you shut down the computer.

Three programs let you install a persistent RAM disk by automatically saving the entire RAM disk to the hard drive when you shut down your PowerBook and automatically re-creating the RAM disk during start-up: Maxima (\$99, Connectix Corporation, 415/571-5100, 800/950-5880), RAMDiskSaver (\$69.95, Atticus Software Corporation, 203/348-6100), and Apple File Assistant (\$79, Apple Computer, 408/996-1010, 800/538-9696). But you can't put the hard drive in the Trash, which would let you start up directly from the RAM disk, so occasionally you have to wait for the hard disk to spin up even when you don't need it.

The bottom line on RAM disks is that they don't save much power in most situations, since a hard drive draws so little power when it's resting. The main advantages

of a RAM disk are faster response during operation (especially if the RAM disk has a System Folder) and not having to wait for the hard drive to spin up.

**Memory** Adding RAM adds only a slight power burden. For example, adding 10MB to a PowerBook 180 (for a total of 14MB) adds just 10ma during operation, 2ma during sleep. RAM may not extract a heavy toll in terms of power, but you pay a heavy price for using virtual memory. Since virtual memory forces considerable disk activity, don't use it under battery power unless you desperately need it.

## Choosing Batteries

Batteries are customarily rated by their energy capacity in amp-hours. Apple now ships 2.9-amp-hour batteries, the highest capacity available; the earlier 2.5- and 2.8-amp-hour batteries have been discontinued. If you buy a new battery, your first choice should be a 2.9-amp-hour unit. However, you might be able to find a 2.8-amp-hour battery for a more attractive price, in which case you must decide whether you are willing to live with slightly less battery capacity. Don't be fooled, though, by companies that claim their 2.8-amp-hour battery is "rated" for 3.0 or 3.1 amp-hours. This kind of word-

ing is playing games with specifications. Several companies sell PowerBook batteries, but at this writing, all non-Apple batteries are limited to 2.8 amp-hours.

In addition to amp-hours, battery capacity depends on how much resting or sleep takes place, the temperature of the PowerBook's environment, and of course, the condition and age of the battery.

## Prospects

Everyone wants a magic battery technology, something that can provide 15 to 20 hours of life on an internal battery. No such technology seems in the offing. A laptop designed from the ground up for battery operation could offer better battery life and desktop power, but no company has yet taken on such a challenge. While you wait for the ultimate laptop and battery, *Macworld's* test results and power-management advice should help you wring every minute of battery life from your PowerBook. **m**

Contributing editor CARY LU writes *Macworld's* PowerBook Notes column.

Macworld Lab would like to thank GW Instruments. Without its help and support, our tests would have taken a lot longer to complete.



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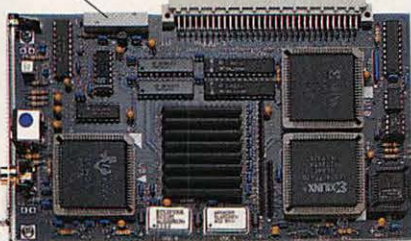
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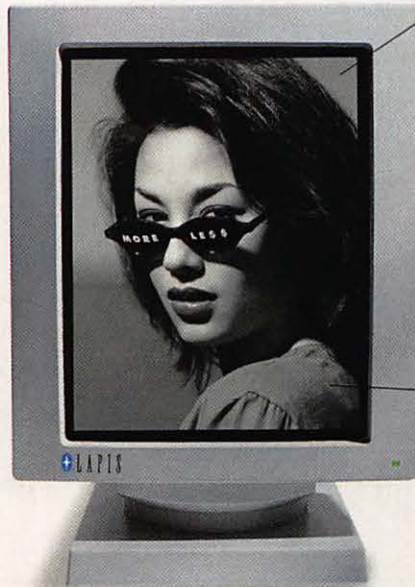


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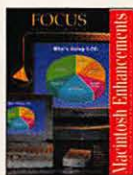


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Circle 201 on reader service card







a viable way to keep several programs available without buying extra RAM. Owners of PowerBooks and some older Macs may also have RAM-expansion limits that encourage them to consider using virtual memory.

For many Mac users, buying more RAM is the best approach. If each of your standard applications demands 8MB of RAM and you have just 4MB, get the extra RAM, since you will see a noticeable slowdown from using virtual memory constantly. (And remember, all those INITs and system fonts take up a huge chunk of RAM.) You can also consider two new products that promise to increase the amount of RAM through software techniques; see the sidebar, "Real Alternatives to Virtual Memory."

If you decide to use virtual memory, you have two choices. One is Apple's virtual memory scheme, which is built into System 7 and works on all 68030-, 68040-, and PowerPC-based Macs (you turn on virtual memory via the Memory control panel). Connectix Corporation sells Virtual and Compact Virtual (\$99 each, 415/324-0727, 800/950-5880), which work on 68030-based Macs running either System 6 or System 7. (Compact Virtual is designed for Mac Plus, SE, and Classic models enhanced with a 68030-based accelerator card.) Neither Apple's nor Connectix's solutions support 68000- or 68020-based Macs, which lack

tem *will* slow down if you use virtual memory improperly—for example, if you switch frequently between multiple applications. In this scenario, virtual memory continually and frantically swaps information, setting aside what's currently in RAM and taking from the disk the information virtual memory needs next.)

To help manage the exchange of data between actual RAM and virtual memory, the Mac creates an invisible file, a *swap file*, on the hard drive. This reserved chunk of disk space acts as faux RAM.

The critical point: if you have enough RAM for a program to run without virtual memory, it won't run any slower with virtual memory enabled. For example, on a Mac with 5MB of RAM, Microsoft Word (which reserves 1200K of system memory) runs at the same speed whether or not you use virtual memory. And why wouldn't it? It fits completely into system RAM, with or without virtual memory.

There are only two times when virtual memory slows down the works. The first is when you try to run a program that doesn't normally fit in your Mac's RAM. If your Mac has 4MB of memory, and you run a program that requires 7MB, virtual memory lets you run it—but you notice a painful slowdown. At this point, the Mac must thrash data back and forth, as needed, between the disk and RAM while you are using the program.

The second slowdown occurs when

the foreground application uses all the Mac's RAM, then a background program (such as a telecommunications program downloading a file, or PrintMonitor printing) will indeed slow down, as virtual memory shuffles program code between RAM and the disk. Therefore, to escape sluggish response, your Mac needs enough system RAM for both the active program and any busy background programs.

The secret to effective use of virtual memory is to keep the active programs and data in RAM all the time. To gauge the amount of system RAM needed to ensure that your active programs and data fit into it, follow these steps.

- Choose About This Macintosh from the Apple menu to see how much RAM the System uses. (You may want to get rid of any INITs and fonts you don't need at this point, to reduce memory usage.)

- For each program you use, call up Get Info from the File menu (or just press ⌘-I) to see how much memory is allocated to the program in the Preferred Size field. (You can actually change this value, as long as it does not fall below the Minimum Size setting. Most people adjust it upward to give the program more breathing room, particularly for programs—like QuarkXPress, Aldus PageMaker, and Adobe Photoshop—that support plug-in software modules.)

- Use Get Info to see the size of the biggest file (such as a spreadsheet, database, or word-processing document) that you expect to open routinely. As you're searching for your largest data file, don't include Photoshop and FileMaker files. These programs' data files can be huge—so huge that each program has its own type of virtual memory. (More later on how to deal with conflicting virtual memory techniques.)

# Realities

by  
**David Pogue**  
and **Galen Gruman**

## CAN SAVE YOU FROM BUYING UNNEEDED RAM



a component, the Paged Memory Management Unit (PMMU), that's required to handle virtual memory.

### The True Story

Many people have misperceptions about virtual memory that inhibit its effective use.

**Slowdown Concerns** The common belief is that virtual memory is worth using only as a last resort—in a memory pinch—because it slows down the Mac so much. The fact is, however, that virtual memory barely slows down work *within the program you're working in*. (Your sys-

tem *change* from one program to another. Again, you pay the virtual memory penalty. Virtual memory must return the RAM-based information about the current program to the hard disk, then immediately read the disk to load the necessary information for the next program. Nonetheless, it's difficult to consider this a slowdown in performance, since even this process isn't nearly as time-consuming as quitting one program and then launching another.

There's one final exception to the no-slowdown rule: background programs. If

- Add the amount of memory used by the System, the program with the largest Preferred Size value, and the largest file. That's how much system RAM you should have. If you use virtual memory in addition to that RAM, you'll see little or no slowdown in day-to-day work, and you'll retain the advantage of having virtual memory when you need it.

**Virtual Memory Limits** When you open your Memory control panel to turn on virtual memory, you have to decide how much total memory you want to wind up with. Apple and many Mac gurus



generally advise you not to get greedy. Set your total memory (RAM plus virtual memory), they say, to no more than twice the amount of real RAM in your machine. That may be a convenient rule of thumb, but it's not accurate. In truth, the amount of virtual memory you can comfortably use increases exponentially with the amount of real memory.

For example, if you have a Mac with 2MB of RAM, you can use Apple's virtual memory only if you make your *system heap*—the memory used up by System 7 and all of your control panels and extensions—as small as possible. That means doing without extensions, turning down your Adobe Type Manager and disk-cache settings, and (if practical) turning off AppleTalk and file sharing. If you go to all that trouble, you can barely get virtual memory onto its creaky feet, at a maximum setting of 3MB to 4MB (RAM plus virtual memory). Even the addition of 512K makes a huge difference in these low-memory configurations.

In general, according to the developer of Apple's virtual memory scheme, on a Mac with 4MB of RAM, a virtual memory setting of 8MB to 10MB is practical; on a Mac with 8MB, you can set virtual

memory as high as 20MB; with 16MB of RAM, you can comfortably set virtual memory up to about 50MB. And if you have 32MB, you can set virtual memory as high as you want.

**Power Mac Usage** Apple recommends setting virtual memory to 1MB more than your physical memory, to free up memory used by the System for applications. Because so few PowerPC programs are shipping, we could not confirm how much of a benefit this technique actually provides. For 680X0 programs, we found that virtual memory on a Power Mac is no different than on a 680X0 Mac.

**PowerBook Usage** If you click the Virtual Memory On switch in the Memory control panel on a PowerBook, an alert message instantly appears, warning that the increased disk activity of virtual memory will run down your battery.

That's true, of course—if the PowerBook is running on battery power. If it's plugged into an AC adapter, however, virtual memory is ideal for these perennially low-memory notebooks. If you use Apple's built-in virtual memory, the annoyance of having to remember to switch off virtual memory before taking battery-powered road trips may be more hassle than it's

worth, but Connectix Virtual can automatically shut itself off whenever the PowerBook is running on batteries.

**Hard Drive Considerations** Both Apple and Connectix agree that the effects of defragmentation have been overemphasized. Only if a hard drive is severely fragmented—say, it's been nearly full for weeks—is virtual memory speed affected. Of course, with a drive that badly fragmented, you would notice performance problems with or without virtual memory enabled.

It is true, however, that a faster hard drive can make a dramatic difference in virtual memory swapping speed; a modern, fast hard drive can make virtual memory perform 50 percent better than, say, an ancient Mac II's hard drive. In general, the higher the capacity of your hard drive, the faster the performance.

### Whose Virtual Memory Is Better?

Surprisingly, when you turn on Apple's virtual memory, it doesn't just create a swap file the size of the extra memory you want. It creates a file as large as the *total* memory: RAM plus virtual memory.

This strategy enhances speed. Yes, a virtual memory scheme could juggle data



## Is Virtual Memory Fast Enough?

Virtual memory performance depends greatly on how virtual memory is used. The more you use it, the more the hard drive's speed affects overall system performance. In the worst case, where all computations occur in virtual memory, your Mac's processing speed will be limited by the hard drive. In cases where virtual memory is used to give just a temporary memory-capacity boost or to store applications that are open but not currently in use, the drag on performance is much less. The results below show performance under low-memory conditions.

**Best result in each test.** Bars show the percentage of time needed to complete a task compared with the time needed by a Mac using sufficient physical memory. (An LC III with 10MB of RAM and no virtual memory = 100 percent.) Shorter bars are better.

### LC III

System 7 virtual memory\*

Connectix Virtual 3.0 with 4K swap page

with 8K swap page

with 4K swap page\*\*

with 8K swap page\*\*

### Switch Programs

This is the best way to use virtual memory. While the slowdown is the most dramatic, it occurs only when the Mac switches a program from virtual memory into physical memory.

### Operations

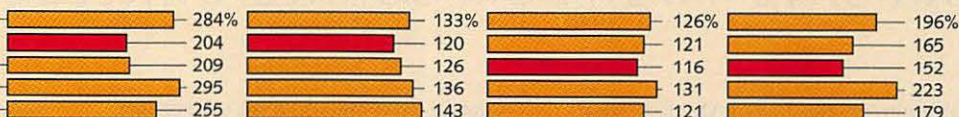
The slowdown is more dramatic if a program frequently needs to use virtual memory (such as when recalculating a spreadsheet).

### Open Documents

The slowdown is minimal if you use virtual memory as an occasional complement to physical memory (such as to open a document when all physical memory is taken).

### Open Program

The slowdown is moderate when the Mac loads an application into virtual memory. However, it takes three times as long to load a program as it does to switch to a previously loaded one.



\*Uses 4K swap page, which cannot be modified. \*\*With DiskSaver option enabled.

### BEHIND OUR TESTS

To test virtual memory performance, we compared a Color Classic and an LC III each with 4MB of RAM and virtual memory enabled, against a Color Classic with 12MB of RAM and an LC III with 10MB of RAM. We set the amount of virtual memory to give both Macs 12MB of total RAM. This let us gauge the effects of virtual memory on low-RAM systems, the kinds that should benefit most, against systems with an amount of RAM that should make virtual memory unnecessary in most cases. We show the results only for the LC III because the Color Classic performed similarly (it slowed down about 15 percent more in each test). We compared performance

of System 7's built-in virtual memory with that of Connectix Virtual. We used a variety of documents (from Microsoft Excel 4.0, Microsoft Word 5.1, and Aldus Free-Hand 3.0) as well as a variety of common operations (in Excel, Word, and Wolfram Research Mathematica 2.2). Finally, we measured the time it took to switch between applications loaded into virtual memory. Because Connectix Virtual allows different memory-page-size and disk-usage options, we performed our tests with all possible combinations.—Macworld Lab testing supervised by Mark Hurlow



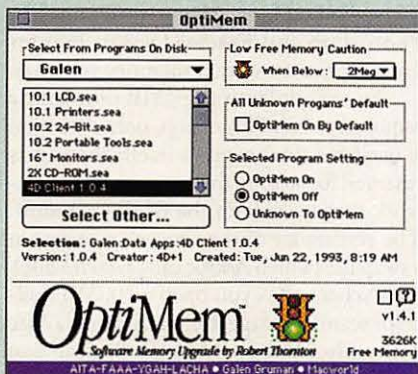
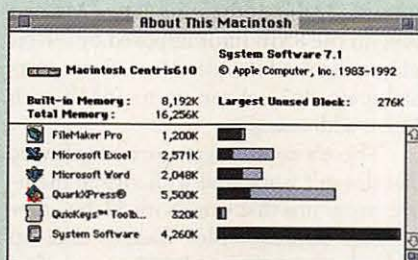
Macintosh users have had only two choices: buy more RAM or use virtual memory. Now there's a third option: memory-boosting software. Two products—OptiMem (\$129, Jump Development Group, 412/681-2692) and RAM Doubler (\$99, Connectix Corporation, 415/324-0727 or 800/950-5880)—change how the Mac deals with memory to make more of it free to applications. Note that while we were able to install the current version of OptiMem on a Power Mac, it did not function correctly (it falsely reported low-memory conditions), at least on an early Power Mac that Apple loaned us. RAM Doubler will not install on a Power Mac; a native version is expected later this year.

**How They Work** The Mac normally allocates a fixed chunk of memory for an application—you can see what those values are and even change them via the Preferred Size field in an application's Get Info dialog box. Once allocated, that memory is unavailable for other programs, even if the allocated memory is not being used. Both OptiMem and RAM Doubler reallocate application memory dynamically, based on what each program needs at the time. RAM Doubler goes a step further by compressing the contents of memory as you work.

This all sounds a bit scary, and I certainly felt uncomfortable trusting the Mac I use every day to them. But I did it, first for a week with OptiMem and then for a week with RAM Doubler. I tested them in a Centris 610 with 8MB of RAM running System 7.1, with all my usual INITs activated (which meant my System took about 3.5MB of the available 8MB).

**OptiMem** The latest version of OptiMem (1.5.4) fixed the erratic operation of previous versions (1.4.1 was reviewed in *Macworld*, March 1994), which often led to system lockups as the program tried to juggle memory for open applications as I repeatedly switched between them. (That's my normal working style, since I'm usually working on parts of a dozen projects in any one day.) If you come across programs that have problems with the latest version, you can set OptiMem so it will leave their memory settings alone.

If you use OptiMem, check with Jump periodically for



**Thanks for the Memory** RAM Doubler (top) gives a Mac almost twice the amount of RAM as is physically installed. The number of active programs shown here on a Mac with 8MB of RAM would not be possible without RAM Doubler. OptiMem (bottom) adds less usable RAM because it makes the Mac work with its physical amount of RAM (although more efficiently). It can also be turned off for any programs it has conflicts with.

(which OptiMem does not have).

I don't trust on-the-fly disk compression, since it acts on permanent data, and I've been burned more than once when using it; but I'm less leery of memory compression, since the worst that can happen is your system will lock up and you'll have to restart (save often, as you should anyhow). And RAM Doubler rarely did lock up in my work.

**Which to Choose?** Because RAM Doubler really did double my available memory, I've left RAM Doubler installed. I've bumped my Centris 610's RAM up by 4MB to 12MB, so Photoshop now loads comfortably with other programs even with RAM Doubler active, but that's less RAM than I would have had to buy without RAM Doubler. OptiMem is an improvement over having nothing, but why settle for just more-efficient memory usage when you can get more memory?—Galen Gruman

updates, since it's likely that new and revised programs will introduce new memory-handling incompatibilities.

**RAM Doubler** Operation with RAM Doubler was similar (see *Reviews*, *Macworld*, May 1994). For example, using it resulted in frequent system lock-ups when I loaded both Adobe Photoshop 2.5 and any other program in memory; the system did not lock up if I added more system RAM to the Mac beyond the original 8MB. Macworld Lab also found that RAM Doubler 1.0 can cause a system lockup when a Mac without RAM Doubler accesses a Mac with it over the network or via a remote-access dial-up link. (The problem does not occur when going from a Mac with RAM Doubler to a Mac sans RAM Doubler.) Version 1.0.1 fixes the problem.

RAM Doubler added about 20 percent to the time it took a Centris 610 to load programs due to the time RAM Doubler needs to compress the data into memory as programs load. The relatively slow speed of the 610's CPU (20MHz) and its lack of an FPU, which aids compression, account for that slowdown. On one of Macworld Lab's Quadra 650s (which uses a 33MHz 040 with FPU), the delay for compression was not noticeable. The slower your Macintosh, the more likely you are to come across this performance penalty

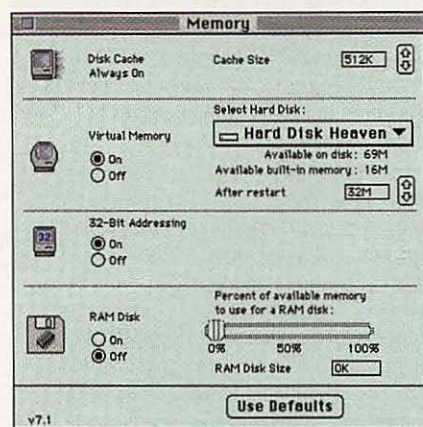
using a swap file only as big as the additional memory you want. But the Mac would have to use this file the way it uses a hard drive, saving data to any space available. The next time your system needed that data from the swap file, it would have to search for it. However, a swap file that equals the total of actual memory and virtual memory is more efficient because your system can keep better track of data by mapping each piece to its own location in the swap file. Under Apple's Virtual Memory, the system

always knows where the data is because it's always in the same location in the swap file. Apple decided to give you faster performance instead of disk space.

However, in making the same trade-off, Connectix's Virtual (3.0 is the latest version) is even faster—taking about three-quarters as long as Apple's virtual memory in situations when virtual memory affects the Mac's speed (such as opening a program), according to Macworld Lab tests. (See the benchmarks, "Is Virtual Memory Fast Enough?")

Virtual also has an impressive option called DiskSaver that uses less of your hard disk space for virtual memory. When DiskSaver is on, the invisible swap file isn't the size of the combined memory—it's only the size of the additional memory you want. You pay a price in speed because of the extra book-keeping Virtual has to do. But even with DiskSaver turned on, Virtual is slightly faster on average than System 7's virtual memory scheme, according to Macworld Lab tests.





**Memory Settings** The Memory control panel lets you set the amount of virtual memory allocated through Apple's System 7. It's important to have 32-bit addressing active so the Mac can use any memory available over 8MB.

Virtual also beats System 7 because it gives the Mac more system RAM to play with. Apple's virtual memory scheme declares the entire System file off-limits to virtual memory swapping. On Macs with little memory to spare, such as a PowerBook with 4MB of RAM, that spoon-for-2MB of memory is a big loss.

The Virtual program, however, analyzes the system heap and declares only some of it important enough to keep in real memory (such as the all-important hard disk driver software). Virtual can identify nearly 1MB of material the Mac doesn't need at every moment—data that's safe to store in the swap file. So with Virtual, that hypothetical PowerBook has 3MB of real RAM, where it would have only 2MB using Apple's virtual memory feature. Remember, the greater the proportion of RAM to virtual memory, the faster the Mac's performance.

Finally, Virtual lets you change the *page size*. A page is the unit of memory that virtual memory swaps to the hard disk and back—under Apple's scheme, a page is a 4K unit. But data on hard drives larger than 256MB is stored in 8K or larger chunks called *blocks*; by letting you change the page size to 8K, for example, Virtual allows for faster data swapping on these larger disks.

### When Not to Use Virtual Memory

All right, so virtual memory is wonderful, and Virtual is even more so. Why hasn't everyone stopped buying RAM chips and turned on virtual memory instead?

Frankly, more people should. But there are indeed times when virtual memory isn't an option. Running a program that's incompatible with 32-bit addressing (such as Microsoft Word 3.0) is one example. Most people turn on 32-bit

addressing when using virtual memory because 32-bit addressing lets a Mac go beyond the 8MB limit imposed by 24-bit addressing used in older Macs. (Using virtual memory, you can go to 14MB with 24-bit addressing.)

There's another category of software that doesn't work well with virtual memory: programs that work with 32-bit color images. Because color images take up such a huge amount of RAM—more than is installed on most Macs—programs like Photoshop and Fractal Design Painter use proprietary virtual memory schemes.

For example, of the 4MB of memory required to run Photoshop, only a fraction is used for the program itself; the rest is reserved for storing the portion of your artwork that's visible in the editing window. The remainder of the artwork is stored in a swap file (which Adobe calls a *scratch disk*). This scheme lets you open a 100MB, full-color scanned image, for example, on a Mac with only 8MB of RAM. Each time you scroll the painting, Photoshop reads from the file on disk to throw the new part of the image onto the screen.

But suppose you're using a general-purpose virtual memory program (like System 7's virtual memory, or Virtual). You scroll. Photoshop grabs the information off the disk and feeds it into RAM, just as it always does. But in this case, you don't have real RAM; you have virtual memory, which means the information gets written *back* to the hard disk. In other words, using virtual memory with Photoshop is superimposing two virtual memory schemes. You wind up accessing the hard disk twice as much, and Photoshop's performance grinds nearly to a halt.

Of course, you could avoid this situation simply by turning off your general virtual memory whenever you use Photoshop or similar programs. But here's a more efficient trick: use the Get Info command on Photoshop's icon, and change the memory size to just under the amount of actual RAM in your Mac. When you launch Photoshop, it will load completely into real RAM; and the virtual memory feature will never kick in, since Photoshop will appear to be comfortable in its allotted true RAM. Photoshop will use its own scratch-disk virtual memory scheme—and you can still enjoy the benefits of general virtual memory for the other programs you may be running.

Other disk-intensive programs that may be too slow with virtual memory—even with the Get Info trick—are QuickTime playback programs. These programs have high data throughput, in which the data loaded into memory is constantly changing. Because virtual memory uses the hard disk, it is too slow

to keep up with that fast stream of high-volume data.

Almost all popular business programs, however, are a match made in heaven with virtual memory.

### Virtually Indispensable

The lesson in using RAM optimization of any sort is that you need enough physical RAM to handle your everyday needs—don't count on a Mac with 4MB and virtual memory doing work designed for a Mac with 8MB of real RAM. But you should take advantage of the extra memory you can get from virtual memory or memory-boosting software to handle the occasional need for more RAM (see "Real Alternatives to Virtual Memory").

The main benefit of virtual memory is to save you the time and hassle of quitting and relaunching programs. Therefore, force yourself to unlearn the habit of quitting when you're done with a task. Launch your programs into your new, yawning memory allotment, and leave them running all day.

Then count up all the real dollars you've saved on memory SIMMs, put your feet up on the desk, and treat yourself to a virtual Acapulco vacation. **m**

Contributing editor DAVID POGUE is the author of *Macworld's Desktop Critic* column.

GALEN GRUMAN is a *Macworld* senior associate features editor.

## MEMORY-ENHANCEMENT SOFTWARE



Fast access, no major compatibility problems, and automated operation—those are the factors we used to judge which memory-enhancement products are best. While more RAM is always good, it's even better to enhance your RAM, even if you still decide to buy more SIMMs.

### Virtual Memory Software

**Virtual 3.0** Its faster speed and more-versatile configuration options make this program the best deal, even compared with the virtual memory Apple offers for free as part of System 7. **Company:** Connectix Corporation. **List price:** \$99.

### Memory-Boosting Software

**RAM Doubler 1.0.1** On-the-fly compression of RAM may sound dubious, but it actually works very well and reliably, with little slowdown on many Macs. **Company:** Connectix Corporation. **List price:** \$99.



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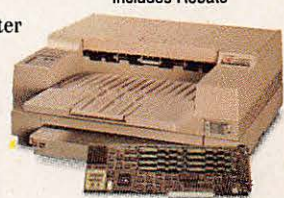


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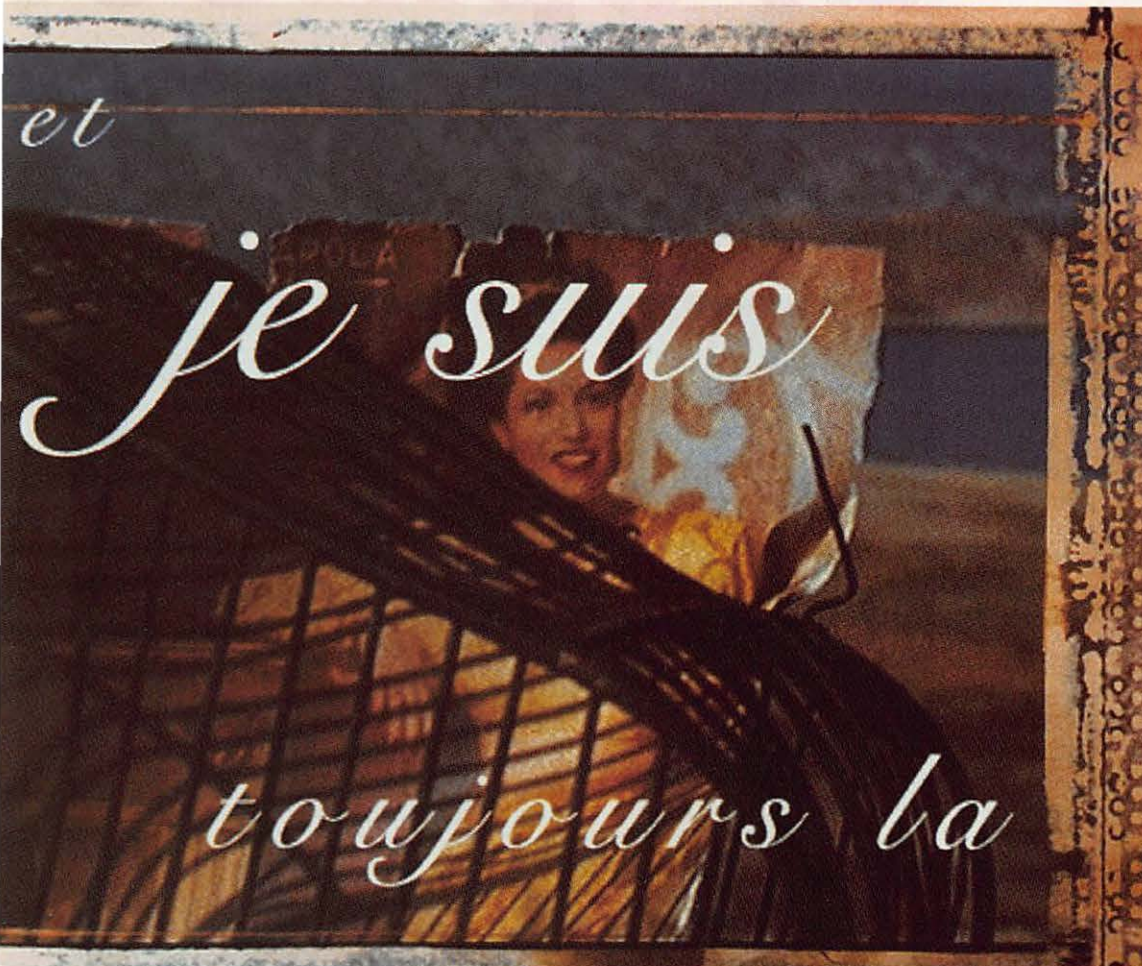
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# Graphics

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## Light Source Promises Consistent Color

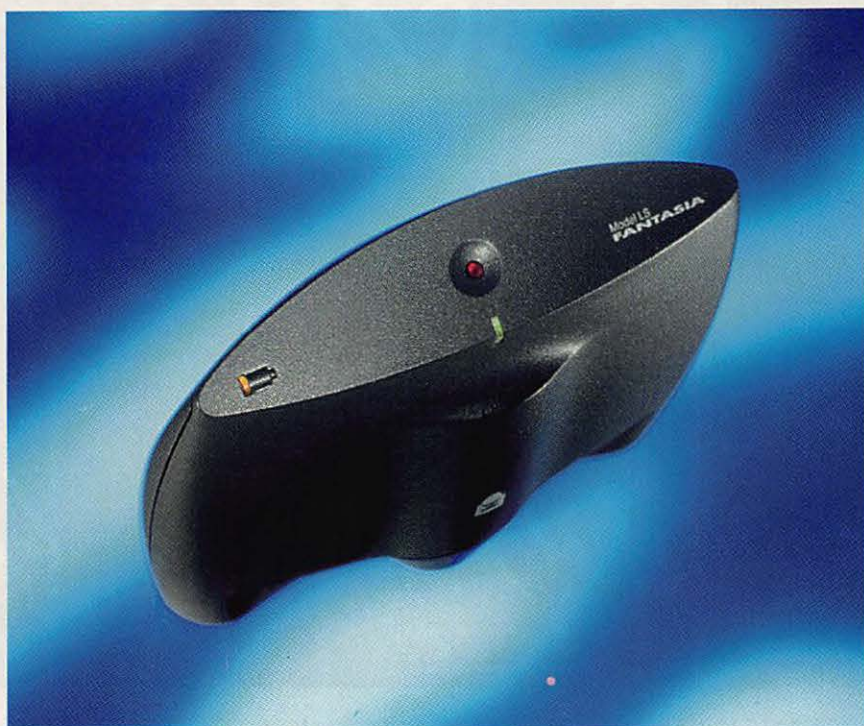
**L**IGHT SOURCE HAS ANNOUNCED Colortron, a hardware-software system that the company says combines many of the color-accuracy and -correction capabilities of calibration devices, light meters, densitometers, colorimeters, and stand-alone spectrophotometers.

With an anticipated retail price under \$1000, Colortron will enable photographers, desktop publishers, graphic artists, and other color-production specialists to easily capture the most accurate color data and maintain it throughout the production process, according to Light Source.

For example, Colortron could help recalibrate or correct the flesh tones in a scanned Adobe Photoshop image. You place and click the hand-held, battery-operated spectrophotometer on the original photograph or transparency, and the device measures the spectral data of the problem area and sends the color data to the Mac's Extended Color Picker (the spectrophotometer must be connected to the Mac's serial port). You could then apply that data to the flesh tones in the digitized image, so that the scan's flesh tones match those of the original.

Added to the image's EPS file, the spectral data provides a single, device-independent color reference for monitors, dye-sublimation printers, image-setters, offset printers, and other devices.

With Colortron, a designer, for example, could ensure that the colors on a restaurant's menu and table linen match in all lighting conditions. Although colors may appear matched under one viewing condition, they may have different spectral curves. As a result, those colors may not match when viewed at sunset by candlelight. By measuring the spectral data of the tablecloth, the menu paper, and the restaurant's ambient light, Colortron would allow the designer to specify an ink color that closely matches



the spectral curve of the dyed cloth.

According to Light Source, no other product on the market offers all of these abilities. Densitometers, for instance, cost at least \$1500, take three measurements of a color, and translate the measurements into an approximate color space. Colortron takes 32 measurements across the full visible color spectrum and always maintains the same precise color data as a reference. Colortron is the only single device that measures reflective, transmissive, and ambient light, the company says.

Colortron should be available in June; planned accessories include a monitor-calibration cup and a spherical light-diffuser. Final pricing wasn't available at press time. Light Source, 415/925-4200.—JIM FEELEY

## Adobe Updates Illustrator for Power Mac

**T**HE LATEST VERSION OF ADOBE Illustrator will ship with versions of the draw program for Power Macs as well as 680X0-based Macs. Illustrator 5.5 includes several new features as well—among them the ability to perform some color trapping and to open and edit files saved in Adobe's Acrobat format.

Through version 5.5's enhanced pathfinder capabilities, you can perform trapping on color objects but not on color



gradients or placed color-graphics files. Illustrator also now offers the ability to import, edit, and export files in a wide variety of formats (including TIFF, Microsoft Excel, and Microsoft Word) via support for Acrobat's PDS file format. Any file saved in PDS format can be opened and edited in Illustrator 5.5. The new Illustrator also includes improved text-formatting support, such as tabs; text blocks with multiple rows and columns; and a spelling checker.

Version 5.5 (\$595) is scheduled to ship in May. Owners of 5.0 can upgrade for \$99; for 3.0 users, the cost is \$149. Both Power Mac and 680X0 versions of Illustrator are included on seven high-density floppy disks. Adobe is also shipping Acrobat Exchange and Acrobat Distiller with the upgrade, at no additional charge. In addition, Illustrator 5.5 will ship with a CD-ROM that includes online documentation, augmented with QuickTime videos, and 180 Adobe Type 1 PostScript fonts. Adobe Systems, 415/961-4400, 800/833-6687.—J.A.M.

## PaintBoard Turns Pro

**R**ASTEROPS HAS ANNOUNCED THE PaintBoard Professional, a 24-bit graphics acceleration card that performs average QuickDraw operations up to four times as fast as the Quadra 950's standard internal video. Supporting large-screen displays up to 21 inches, the PaintBoard Professional features an extended desktop of 4000 by 3000 pixels for viewing oversize images. It also includes a 9-bit DAC (digital-to-analog converter) for improved color fidelity.

The PaintBoard Professional can accommodate an optional daughtercard, the RasterOps DSPPro. The DSPPro includes twin 66MHz DSP3210 chips to boost performance of Photoshop filters. The PaintBoard lists for \$2199; together with the DSPPro, it's \$2999; the DSPPro is \$1099. RasterOps, 408/562-4200, 800/729-2656.—CATHY ABES

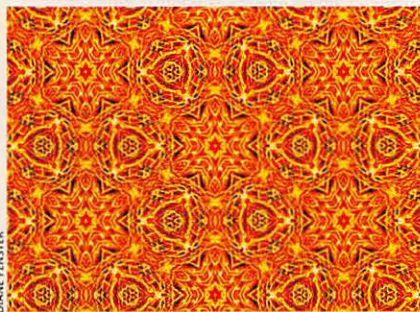
## Tiling Patterns Emerge from Chaos

**T**ERRAZZO, A \$149 ADOBE PHOTOshop plug-in filter from Chaos Tools, lets you create repeating patterns from any PICT or native Photoshop formatted image in RGB, CMYK, and gray-scale modes.

Using any of 17 geometric shapes to tile the pattern it creates, Terrazzo simulates a kaleidoscope. Moving the shape around an image produces dramatically different patterns. Controls include opacity,

lightness, darkness, and hue/saturation/brightness. A Continuous Preview feature lets you see the effects as you create them. Blend Radius lets you blur tile edges to minimize the tiling effect. Terrazzo is due by the end of April.

Xaos has also released Fresco, a \$199 CD-ROM of 80 royalty-free textures and backgrounds created by artist George Lawson, as well as an optimized version of Paint Alchemy (1.0.2f) that uses the Mac's FPU to boost performance by up to 100 percent. Xaos Tools, 415/487-7000.—CATHY ABES



## Beyond 24-Bit Scanning

**T**WO SCANNER MANUFACTURERS recently announced color flatbed scanner models (under \$3500) capable of capturing images with pixel density beyond 24 bits.

With an optical resolution of 600 by 1200 dpi (2400 by 2400 interpolated), Microtek's single-pass ScanMaker III (\$3499) captures color images at up to 36 bits and automatically samples them down to true 24-bit images.

Also new is the ScanMaker IIHR (\$1699), a three-pass 24-bit scanner with 600-by-1200-dpi optical resolution (2400

by 2400 interpolated). Both scanners come bundled with Adobe Photoshop and include Microtek's Dynamic Color Rendition (DCR) color-calibration and -correction technology. Both scanners are due to ship in March.

Meanwhile, Umax Technologies has announced PowerLook (\$3495), a 30-bit color flatbed scanner (10 bits per RGB channel) that supports scanning of transparencies.

The one-pass PowerLook offers an optical resolution of 1200 by 600 dpi, which can be interpolated to 1200 by 1200 dpi (in hardware) or 2400 by 2400 dpi (in software). It has a SCSI-2 interface and a 2MB input/output buffer for fast scanning. Photoshop 2.5.1 is bundled.

Potential buyers of scanners offering more than 24-bit capture should keep in mind that, aside from Photoshop 2.5.1, few programs available today support more than 24-bit color. Microtek, 408/297-5000, 800/654-4160, Umax, 510/651-8883, 800/562-0311.—J.A.M.

### IN BRIEF

**Legal Update** It is believed to be the first image-sampling lawsuit: on February 16, FPG International, a stock-photography service, filed a \$1.4 million copyright infringement complaint against *New York Newsday*. The suit claims *Newsday* scanned photos from an FPG catalog and used parts of the photos in a published illustration, without permission.

**Two Printers in One** Seiko Instruments' Professional ColorPoint 2 PSF combines thermal-wax transfer and dye-sublimation technologies. The 300-dpi PostScript Level 2 printer includes a 160MB hard drive, handles full-bleed tabloid pages, and supports three color-management systems: EfiColor, ColorSync, and ColorSense. Due in mid-April, the printer costs \$16,499; \$17,199 with EtherTalk or TCP/IP; and \$17,499 with both protocols. 408/922-5900, 800/888-0817.

**Imagesetter Print Preview** Working Software's CheckPost (\$249.95) imitates imagesetter output on a laser printer to ensure there are no printing problems before sending the file to the imagesetter. 408/423-5696, 800/229-9675.



It's not surprising that the editors of Macworld, MacUser and MacWeek praise Mirror products, since we design and build them to please the toughest customer of all: you! Whether we are selecting a power cord or designing a new graphics processor chip, we sweat all the details, so you get consistently excellent products for a great price.



**Macworld, December 1993**  
**Nikon CoolScan**

From our fast, dependable hard drives and our razor-sharp monochrome displays to our highly acclaimed color scanners and the amazing Tornado graphics systems, every Mirror product is designed to give you the most for your money. No other company offers you the selection, performance and value of Mirror Technologies.



**MacUser 1993**  
**Nikon CoolScan**

### Scanning The Possibilities

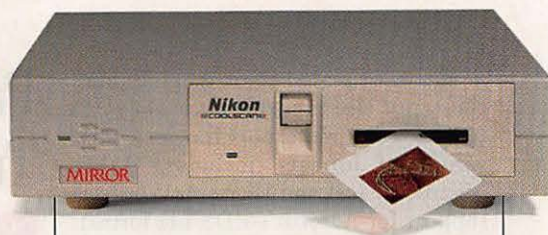
Whether you are scanning black & white photos to include in a simple newsletter, or are scanning 35 mm color slides for inclusion in a national magazine, Mirror offers a scanner that can get the job done.



**MacUser**  
**November 1993**  
**Nikon CoolScan**

### Coolscan Slide Scanner

For professional quality scanning of 35 mm slides (or negatives), nothing comes close to the performance and value of the Mirror Coolscan System. This remarkable slide



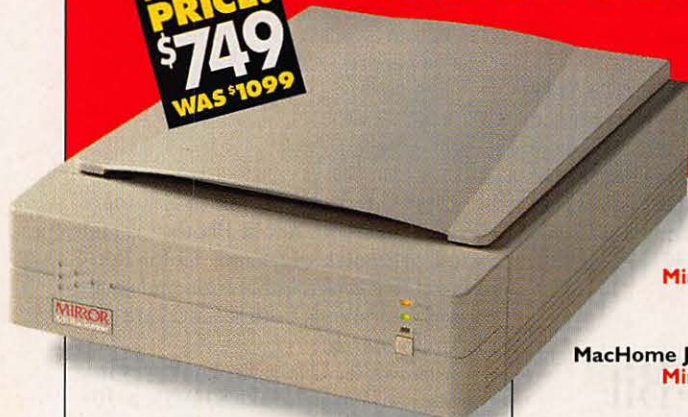
scanner features 2700 dpi resolution, for brilliant reproduction of even difficult images. The Eddy Award-winning Coolscan is the first scanner to bring true, reproduction quality color scans to the desktop for under \$2000!

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600 dpi w/Photoshop 2.5.1 and Read-It!	\$ 899
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1200 dpi w/Photoshop 2.5.1 and Read-It!	\$1599
Transparency Adapter for 600/800 models	\$ 599
Transparency Adapter for 1200 model	\$ 699
Mirror CoolScan Slide Scanner	\$1999

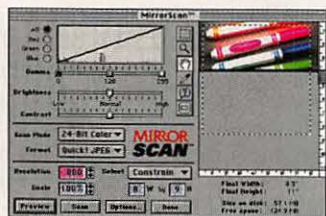
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**MacUser UK**  
**October 1993**

**Mirror 800 Color Scanner**



**MacHome Journal, November 1993**

**Mirror 600 Color Scanner**

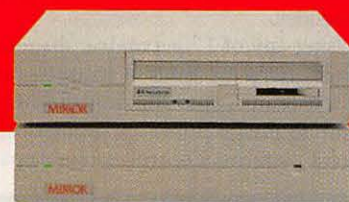
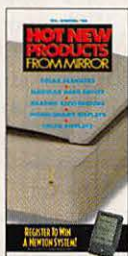


**Macworld**  
**November 1993**

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## Displays Of Brilliance

The newest additions to our award-winning monitor line-up, the Mirror Color Portrait Display and the Mirror 21-inch Color Display, embody everything that the critics love about Mirror products: high quality, unbeatable features, and a great price.



**Macworld**  
July 1993  
**Full-page Display**

Portrait displays have long been a favorite of desktop publishers and writers, but until now, you were limited to monochrome. The new Mirror Color Portrait Display is the result of countless requests for an affordable color monitor that could display an entire page. It works with the built-in video of newer Macs, as well as many standard video boards (including the Mirror Tornado board, of course.)

## Colorful Value

The Mirror Display line also includes our best-selling 14, 16, & 20-inch Color models, and our standard-setting 15 & 19-inch monochrome displays. Models are available for most Macs.



**MacUser**  
February 1994  
**16-Inch Trinitron**

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If you use a Macintosh for design, illustration or image-processing, the new Mirror 21-inch Color display is for you. Its brilliant color, superb sharpness and 1152 x 870 resolution will satisfy the most demanding user, and its low price make it irresistible. This display actually puts itself into low-power "sleep" mode when there is no user present!



ProView Color Displays		w/Tornado
21-inch	\$2099	\$2799
20-inch Standard	\$1399	\$2099
20-inch Trinitron	\$1999	\$2699
Color Portrait	\$799	\$1499
16-inch Trinitron	\$999	\$1699
14-inch	\$349	n/a
Mirror Monochrome Displays		w/board
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19-inch Two-page	n/a	\$749
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**MacUser**  
July 1993



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# Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

**Artist:** Los Angeles-based illustrator and animator David Peters specializes in collage. His work has appeared in such magazines as *Movieline Magazine*, *Electronic Entertainment*, and *New Media*, as well as on album covers and movie posters.

**How It Was Done:** For the illustration that appeared in last month's feature article on copyright issues, "Are You Breaking the Law?" Peters began by taking two photographs of a torn-off magazine cover depicting Arnold Schwarzenegger—a close-up of his face, for placement on the canvas, and an angled shot of the whole cover, for placement on the floor. Peters cut the cover out of the photo with an X-acto knife and placed it on a white board to scan it. In general, he finds this technique to be faster than using the magic wand or the lasso to select parts of a scanned image in Photoshop, and it gives him more control over the image's edges. In this case, he cut out the image to maintain the cover's torn edge. After scanning the cover, he used the perspective tool to match the angle of the floor.

Next Peters scanned in the close-up shot of Schwarzenegger. As with each of the other scanned elements, he adjusted the image with the Levels command, moving the right-hand Input Levels triangle to the left to whiten the background and lighten the entire image. After selecting the head with the lasso, he deleted the background. Because the terms involved in using Schwarzenegger's likeness were so restrictive, Peters completely altered the image so that it was no longer recognizable as Schwarzenegger's face by substituting the eyes, mouth, nose, and ear from another photo. Because the illustration was meant to show how disparate elements from different sources can be combined to create a new image, Peters blended some of the facial elements more than others.

Peters scanned in a photo of his own car and then added a fin by stretching, scaling, and distorting the rear fender. Then he sized and posed the car over the canvas and saved it as a separate file. **m**

1 The photograph Peters took of the magazine cover shot of Arnold Schwarzenegger, which he scanned into Photoshop.



2 Using the perspective tool, he widened and stretched the top of the head to change Schwarzenegger's characteristic short cut to a longer hairstyle; then, still using the perspective tool, he pulled down the chin to elongate the face, and used the distort tool to tuck in the right jawline.



3 The facial parts taken from their original owner and awaiting transplantation to their new home. Peters used the same technique for each element: selecting it with the lasso, cutting it out, then making it into a floating selection on the face-in-progress and resizing and shaping it to fit.

## THE TOOLS

**Hardware:** Mac IIx with 32MB of RAM; 170MB internal hard drive; 1.2GB external hard drive; SyQuest 44MB removable-cartridge drive; 128MB magneto-optical drive; 19-inch SuperMac RGB monitor with PDQ 24-bit accelerator board; Microtek MSF-600ZS color scanner.

**Software:** Adobe Photoshop 2.5.1.

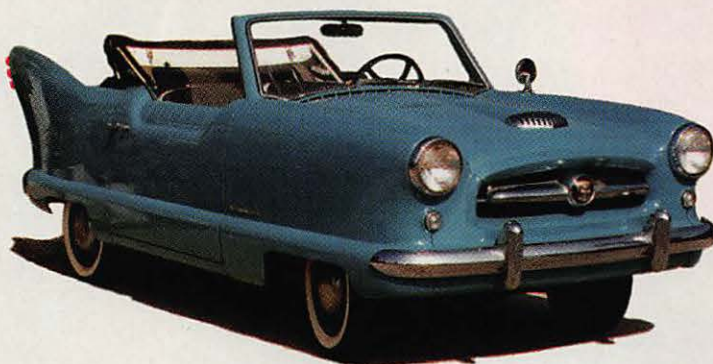




**4** With the scale tool he squeezed the eyes to make them fit the new face; then he used the airbrush and smudge tools to blend them with the rest of the face. He intentionally left the right eye's rough edges showing because he wanted the eye to look like what it was—a grafted facial element.



**5** The scanned photo of the artist's car—a blue 1954 Nash Metropolitan convertible—destined to be altered in shape and color.



**6** To make the fin, Peters cut out the rear fender, copied it, and stretched it vertically with the rectangular marquee (from the Effects submenu under the Image menu). Then, using the scale tool (Effects), he scaled the fin up vertically to elongate the selection, grabbed the top left corner, and stretched it out using the distort tool (using distort alone would have made the fin too fat).

**7** Once he had correctly positioned the fin, Peters used the rubber stamp to clone the reflection from the fin onto the lower portion of the car to make it blend in.







# FreeHand Illustrator

*The two top  
PostScript  
draw programs  
face off*



BY DEKE McCLELLAND

Until recently, Adobe Illustrator and Aldus FreeHand seemed to be operating under some kind of pact. Illustrator clearly catered to the select, free-form drawing crowd, offering a dynamic pen tool, great text-manipulation capabilities, and a smattering of small-document-creation options such as automated charts and graphs. Meanwhile, FreeHand went after the more down-to-earth schematic artists by supplying grids, numerical object positioning, independent layers, and the ability to draw and edit in the preview mode.

Then, in late 1993, Adobe went for the jugular with Illustrator 5.0. The revised program offers multiple undos, object-alignment options, automated gradations, layers, and drawing in preview mode—in short, Adobe added just about everything Illustrator had been criticized for lacking in the past. Perhaps deciding that the best defense was an aggressive counterattack, Altsys (which writes FreeHand for Aldus) rebounded by bolstering version 4.0's text-handling and document-creation capabilities so they not only surpass those in Illustrator but in

many ways outperform similar features in Aldus PageMaker and QuarkXPress.

Suddenly, things have gotten very exciting in the world of object-oriented graphics. In fact, FreeHand and Illustrator have become so powerful and well matched that it's more difficult than ever to decide which program is right for you.

(At press time, things had become even more exciting than we originally thought. On March 15, Adobe and Aldus announced a definitive agreement to merge. Both FreeHand and Illustrator will continue to be sold and supported by the newly formed company, at least for now. For more information on the merger, see *News*, in this issue.)

To help you sort it all out, the "Drawing Distinctions" table offers a detailed, side-by-side comparison of both programs in seven major areas. In this table the usefulness and implementation of over 100 features and tools that are found in both applications are graded from A to F. I have graded the programs only on





**Tom Ward** is a free-lance artist who originally created this illustration in FreeHand 3.1. He revised it using version 4.0. To create the stars in the background, Ward double-clicked on the polygon tool, then used the sliders to set the number of points and the acuteness (pointiness) of the stars. He created the stars by clicking and dragging; the more you drag a star, the larger it gets. Depending on the direction in which you want a star to rotate, you can drag it either clockwise or counterclockwise. After selecting a star, he opened the Inspector floating palette, clicked on the fill icon and used the slider to select a radial fill of purple at the edge to white in the center. For some of the stars, he dragged and dropped yellow onto the star's edge to change the fill to a yellow-to-white gradient. Then he used the Locate Center tool to change the center of the radial fill.

the features that differ significantly between the two programs, as there are hundreds of functions—rotating and skewing objects, creating irregular text blocks, and printing to high-resolution imagesetters, to name just a few—that perform roughly the same in both programs. The article focuses on the main distinctions between the two applications in the seven categories.

In addition, Macworld Lab performed a battery of tests on FreeHand and Illustrator to see how they handle such tasks as screen redraw, preview, and printing (see “Putting FreeHand and Illustrator to the Test”).

Finally, it should be noted that this article reviews only the 680X0 versions of FreeHand and Illustrator. During the time we performed our tests, final Power Mac releases of both programs were not available. However, as part of our reporting on the Power Mac introductions, Macworld Lab tested a beta Power Mac version of FreeHand 4.0 on a Power Mac 7100/66 and found it to be overall 2.4 times as fast as 680X0 FreeHand on a Centris 650 (see “Power Mac Software,” *Macworld*, May 1994). For more information on the Power Mac upgrade of Adobe Illustrator, see *Graphics* news in this issue.

### Interface, Setup, and Compatibility

This is one of the areas in which Illustrator and FreeHand differ most. Illustrator is far superior in controlling the display of artwork on screen, permitting you to preview a stationary object independent of its neighbors; hide objects and selection outlines; and continue working even while the program is previewing complicated artwork. But FreeHand has better document-setup capabilities and a slew of import and export options that Illustrator lacks.

FreeHand 3.0 veterans may find themselves cursing 4.0's new interface nearly as often as they praise it. Perhaps for the better, FreeHand has shed such questionable features as numerical control-handle positioning and automated trapping spreads. However, it has also changed common keyboard commands, for example, ⌘-M, so that they produce different results; dropped items, such as kerning values, from the information bar; killed useful functions, like aligning existing objects to the grid; entirely abandoned support for such attributes as vertical text alignment; and randomly deposited hundreds of unrelated functions into the new, multipaneled Inspector palette—all of which is likely to throw longtime users for a loop.

By contrast, Illustrator has changed the way its masking feature works but has otherwise limited its interface changes to additions and enhancements. This is not to say Illustrator is without its share of interface blemishes. The Filters menu is as much of a mishmash as the Inspector palette. But at least the Filters commands represent new features, not changes to existing features, an important distinction.

### Drawing and Editing

When it comes to drawing and editing, Illustrator and FreeHand are cut from the same fabric. But striking differences remain. Illustrator offers the smoother pen tool, while FreeHand's new bezigon tool is slightly more functional, supplying access to the frequently useful connector point. FreeHand now provides a real tool for drawing regular polygons and stars, while Illustrator buries the function in a remote recess of the Filters menu. Both programs provide calligraphic free-hand tools that react to pressure-sensitive input, but only Illustrator includes cap



## Putting FreeHand and Illustrator to the Test

We tested how FreeHand and Illustrator handled two different kinds of documents. The first document was a color drawing filled with gradations, object blends, tile patterns, masks, text on a curve, and complicated paths. The second was a page layout with linked text blocks, display type, and a placed color EPS image. We tested on a Centris 650 with 16MB of memory in 24-bit color mode (using a SuperMac Thunder II GX•1360). We printed on an Apple LaserWriter IIg with and without PhotoGrade and FinePrint, and with both LaserWriter Drivers 7.0 and 8.0.

### SCREEN REDRAW

Smaller bars are better. Times are in seconds.

We performed a variety of zooming and scrolling tests in the Preview mode to determine how quickly the program would redraw the entire document.

### KEYLINE/ARTWORK TASKS

These results show how efficiently the programs moved, scaled, rotated objects, and redrew the affected portions of the screen. Illustrator calculated the tasks faster than FreeHand did, which is apparent in Keyline/Artwork Tasks (where screen redraw is not a factor). In Preview mode FreeHand's faster screen redraw more than made up the difference.

### PREVIEW TASKS

### PRINTING

Illustrator was slower in all tests. But with LaserWriter 8.0, its performance came close to FreeHand's.

	Drawing	Layout	Drawing	Layout	Drawing	Layout	Drawing
FreeHand 4.0	47	17	40	13	51	16	380
Illustrator 5.0	116	59	19	6	59	38	596



# Drawing Distinctions

Grade FreeHand 4.0

Grade Illustrator 5.0

## INTERFACE, SETUP, AND COMPATIBILITY

B

C

### Screen display

D

A

Interruptible screen redraw	C	Must press $\mathbb{H}$ -period to interrupt preview.
Preview selection only	D	Works only while mouse button is down.
Display preferences	B	Control display of gradients and TIFF.
Crosshair cursors	F	Big cursors can impair view of illustration.
Hide objects	C	Must hide all objects on a layer together.
Selection outlines show layering	F	Can't tell which layers selected objects are on.

A	Automatically pauses if it detects so much as a mouse-click.
A	While in this special mode, you can select objects to preview them.
C	Control display of EPS images and tile fills, but not gradients.
A	Available when caps lock key is pressed.
A	Hide any selected object.
A	Selection outlines are colored according to layer.

### Navigation

B

B

Levels of magnification (in percent)	A	12-800; 7 increments, plus custom.
Scrolling	A	Scrolls in single-pixel increments.
User-definable views	F	Must scroll and zoom manually.
Create multiple views of single document	F	Limit of one window for each illustration.
Levels of undo	A	100; fewer than Illustrator, but anything over 10 is gravy.
Switch applications when dialog box is open	A	Convenient feature.
Interface consistent with previous versions	C	All kinds of disconcerting changes.

B	6.25-1600; 17 increments.
C	Scrolls in 40-pixel chunks.
A	Hides, shows, and locks layers; remembers preview settings.
A	Can view the same portion of a drawing at two zoom ratios.
A	200
F	Included in version 5.0.1.
B	Mostly works as before; Filters menu is a mess.

### Tools, menus, and palettes

B

B

Access tools from the keyboard	A	Can access all drawing tools.
$\mathbb{H}$ and option keyboard equivalents	C	Lacks equivalents for Preferences, Close, and Output Options, justification and leading, and Don't Save.
Options automatically highlight in palettes	C	Only when you option-click with a transformation tool.
Collapse palettes	B	Collapse down so only title bar is visible.

C	Less than half are accessible.
B	Lacks equivalents for masking or converting text to paths.
A	Palettes intelligently respond to commands and other operations.
C	Collapse midway only.

### Document setup

A

D

Maximum artwork size (in inches)	B	54 x 54, 30 letter-size pages
Page scrolling	A	Page-navigation buttons modeled after PageMaker's.
Add, move, and duplicate pages	A	Full suite of page-control options.
Mix page setups within a single document	A	FreeHand is the one and only.

A	120 x 120, 154 letter-size pages
F	Must scroll manually.
D	Move page tiles only.
F	All pages must be the same size.

### Importing and exporting

A

C

Import/export competitor's formats	B	No support for Illustrator 4.0 for Windows or 5.0.
Opens its own file formats	C	Doesn't recognize FreeHand 1.0 files.
Paste PICT objects from Clipboard	A	Great for converting Excel charts to PostScript artwork.
Export to PICT format	A	Exports both objects and images.
Open and edit EPS files	A	EPS files can be editable or uneditable.
Import and modify TIFF images	A	Can modify gray-scale images only.
Import Photoshop paths and masks	B	Must save paths and masks to disk.

F	FreeHand doesn't publish its file format.
A	Supports all previous version files.
F	No support for PICT objects.
C	Exports PICT images via Clipboard only.
B	EPS files are always editable.
F	That'll be the day.
A	Can transfer paths via Clipboard.

## DRAWING AND EDITING

B

B

### Drawing tools

C

B

Pen-tool performance	B	Path tracking is as jerky as a stop-action animation.
Connector point	A	Provides for smooth transitions between segments.
Regular polygons and stars	A	Can draw, but from center only.
Spirals	F	Not offered, but you're not missing much.
Calligraphic freehand tool	B	No cap or join options for lines.
Automatic tracing tool	C	Lacks precision-tolerance controls.
Graphing tools	F	Not offered.

A	Poetry in motion.
F	Corner and smooth points only.
B	Can't draw shape; must specify numerically.
B	Paths get squarish toward center; again, must specify numerically.
A	Works nicely; has cap and join options.
D	Works on one path at a time; traces dark and light areas only.
B	Can't create horizontal bar graphs.

### Reshaping paths

B

B

Select object hidden behind selection	A	Control-click to select down stacking order.
Edit rounded corners	C	Applicable to rectangles only.
Convert points	B	Must position control handles after converting.
Add/delete points	A	Automatically deletes extraneous points.
Split segments	A	Can cut across multiple paths with the knife tool.
Drag segments to reshape path	A	By option-dragging, you can even bend straight segments.
Automatic center point	D	Rectangles and ellipses only.
Automatic handle placement	A	Automatic curvature function is great for new users.
Combining paths	B	Subtracts back path from front only.

B	Turn off Area Select option or exit preview mode.
B	Can't easily adjust corners once they're rounded.
A	Can convert and position control handles in one operation.
B	Requires special tool; no control over handle placement.
B	Can split only one segment at a time with scissors tool.
B	Dragging straight segments moves them.
B	Not a true center; based on bounding box.
F	Manual positioning can be particularly difficult for beginners.
B	Some path operations require FPU.

### Guides, rulers, and measurements

C

B

Grids	B	Can't automatically align an object to the grid.
Custom guidelines	F	You can't send path to guide layer.
Ruler-tracking lines	A	Tracks entire object when dragging.
Measure distance between two points	C	Have to drag one point onto another, then undo.
Information bar	B	Doesn't monitor text formatting.

F	Must build grids manually using guides.
A	You can edit along a circle or irregular path.
C	Tracks cursor only.
A	You don't even have to use measure tool.
A	Better than FreeHand's.

### Aligning objects

B

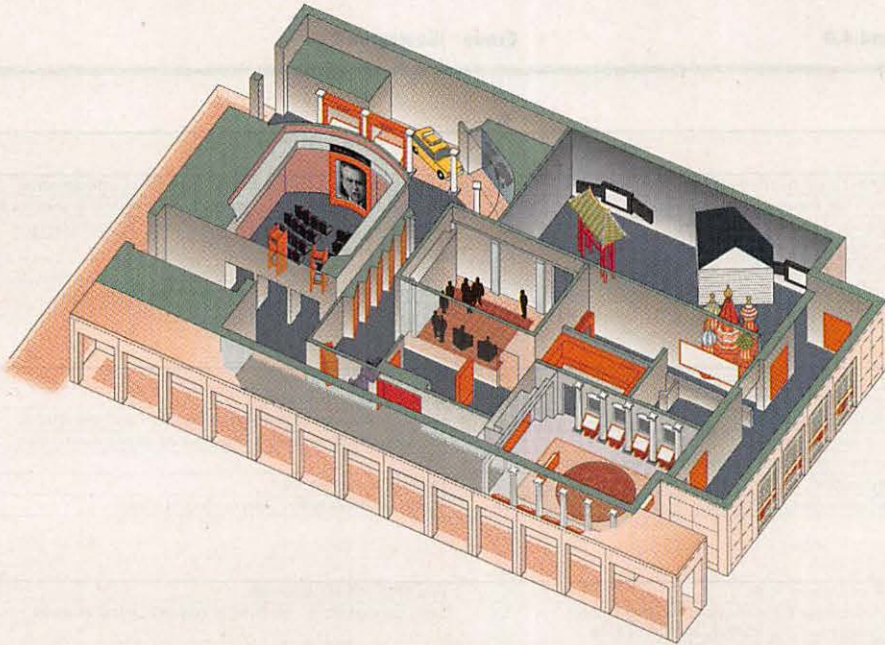
B

Snap to point	B	Can assign sounds to snaps, which can prove annoying and definitely make it hard to work while on the phone.
---------------	---	--

A	Program changes the appearance of the cursor and displays the word <i>Snap</i> in the information bar.
---	--

**Grade Key** + = New or significantly altered feature. A = Works like a champ. B = Lacking in some respect, though still quite useful. C = Frustrating implementation; requires more work than it ought to. D = Barely usable, thanks to terrible implementation. F = Feature is absent.





**Val Cohen** is an illustrator and FreeHand beta-tester who also runs the computer graphics systems for the *Orange County Register* in Southern California. This illustration originally appeared in the *Register* for the opening of the Richard M. Nixon Presidential Library in Yorba Linda, California. Cohen reworked the illustration in FreeHand 4.0.

Using a floating palette, Cohen was able to change the color of a wall—from a flat blue-gray to a graduated fill that blended to white—simply by selecting the wall and dragging and dropping a gradient onto it.

Cohen could quickly cut a window out of the wall, since FreeHand now lets you select two objects and remove one from the other using the Punch command. Creating the zigzag wall was a simple two-step operation: he selected all the shapes he wanted to combine and chose the Union command (Arrange > Path Operations).

and join options for specifying the appearance of ends and corners.

The tracing tool is the only real disappointment in either program. Although some minor controls have changed—FreeHand dropped some options between versions 2.0 and 3.0—the tools in both programs are nearly identical to their original incarnations. They detect only two shades (light and dark), and they always result in closed shapes, never open lines. If you plan on converting many scans to drawings, you really have no choice but to buy Adobe Streamline (\$199).

### Transformations and Effects

In FreeHand 3.0, you could move an object numerically by pressing ⌘-M, entering a couple of values, and pressing the return key. In version 4.0, you have to press ⌘-M, click on the move icon in the Transformation palette, press ⌘-tilde (~) to activate an option box, enter the values, and press return.

Meanwhile, Illustrator's new plug-in filters provide access to several automated special effects, many of which FreeHand has not implemented. For example, Illustrator provides three filters that move control handles and points randomly to jazz up path outlines. You can even twirl a path around a central point, in much the same way as with the Twirl filter in Adobe Photoshop. Unfortunately, Illustrator requires you to double and even triple the number of points in the path to ensure the success of the filter, and even then it frequently disappoints.

### Formatting Text

For more than six years, Illustrator and FreeHand have cut themselves off from a variety of capabilities because both pro-

grams lacked support for the modest tab character. To Illustrator, tabs are still taboo, and as a result, to create a simple hanging indent you must wrap text around a vertical line.

FreeHand 4.0, on the other hand, recognizes tabs, and it also allows you to

divide a text block into rows and columns to create fully functioning tables complete with multiple-line entries. You have to go to three different places in the Inspector palette just to add a paragraph rule; otherwise FreeHand is a fantastic choice for creating lists and tables.

## TEN TASKS FREEHAND DOES BETTER THAN ILLUSTRATOR

**1. Navigate in the preview mode.** FreeHand is significantly faster in preview mode, and you can scroll in single-pixel increments and zoom to precise view sizes.

**2. Blend objects.** After blending between two objects, you can edit one or the other, and FreeHand automatically recalculates the blend. In Illustrator, you have to delete the original blend and start over.

**3. Design multipage documents.** Except for a spelling checker and automatic page numbers, FreeHand has everything it takes to create small, graphics-intensive documents.

**4. Create tables.** Besides supplying a wide array of tab-stop options, FreeHand enables you to divide a text block into rows and columns, making it one of the most flexible programs for making tables.

**5. Draw schematics.** FreeHand is still the better program for precisely positioning points and objects. Most essential, FreeHand provides a grid; Illustrator does not.

**6. Import and manipulate TIFF images.** FreeHand satisfies TIFF fans by letting them not only import TIFF images but also control on-screen image resolution, adjust brightness levels, and colorize gray-scale and black-and-white artwork.

**7. Assign colors to objects.** FreeHand 4.0 lets you drag and drop colors to change a stroke or fill, adjust the direction of a gradient fill, and reposition the center of a radial fill, all without so much as selecting the affected object.

**8. Print custom halftone patterns.** Only FreeHand allows you to change the frequency and angle of halftone patterns assigned to selected objects.

**9. Trace imported images.** FreeHand's automatic tracing tool is inadequate. But when it comes to tracing bitmapped images by hand, FreeHand's template controls leave Illustrator's in the dust.

**10. Design arrowheads.** Unlike in Illustrator, where you select from a handful of predefined dingbatlike arrowheads and then scale them to size, FreeHand gives you the absolute freedom to draw your own arrowheads.



# Drawing Distinctions (continued)

## Grade FreeHand 4.0

## Grade Illustrator 5.0

Position points numerically	A	✦ Dropped control-handle coordinate.	F	Must position points manually.
Drag path by its center point	F	Snap to stationary center point only.	A	Great for snapping and aligning.
Align points and paths	B	Align whole paths only.	A	✦ Average command aligns points; Align Objects filter aligns paths.
Distribute paths	A	Distributes according to sides, center, and width.	B	✦ Center distribution only.
Lock and unlock objects	A	Can selectively unlock paths.	B	Must unlock all locked objects at once.
Align and snap to locked objects	A	Can select locked objects and use them in operations.	F	Anything locked is untouchable.

## TRANSFORMATIONS AND EFFECTS

<b>Moving, scaling, rotating</b>	<b>C</b>		<b>B</b>	
Move numerically	D	No direct distance and angle options; also harder to use.	A	Supports direct and indirect distance values.
Resize without using special tool	A	Can drag corner of shapes and groups.	C	Can drag sides of rectangle with direct-selection tool.
Transform numerically	A	✦ Can click in document to set origin point.	B	Can't numerically specify origin.
Set transformation origin point	B	Set origin point during drag; must reset each time.	A	Click to set origin point; can then use repeatedly.
Scale and rotate multiple objects	F	Must transform each object independently.	A	✦ Via Scale and Rotate Each filters.
Free-form distortion	F	No such option.	C	✦ Must perform inside cramped dialog box.

## Clones and copies

Transform and clone simultaneously	F	Requires separate operations.	A	Using the option key or the Copy button.
Paste behind or in front of selected object	B	Paste behind only.	A	Can do both.
Repeat series of transformations	A	Repeats several transformations performed in a row.	C	Repeats last transformation only.

## Automated effects

Edit object blends	A	Amazingly useful capability.	D	Can reblend colors using filter, but that's it.
Blend between geometric shapes	C	Must ungroup the objects before blending.	A	✦ No ungrouping necessary.
Randomize path outlines	F	Lacks special-effects filters.	A	✦ Roughen, Scribble, and Tweak filters.
Expand and contract segments	F	Ditto.	A	✦ Bloat and Punk filters.
Twirl path outlines	F	Ditto, again.	C	✦ Filter requires additional points but produces rough results.
Trace paths around stroke weight	A	✦ Converts to straightforward compound path.	C	✦ Converts to single path, which is difficult to edit.
Offset path outline	B	✦ Changes original.	A	✦ Clones and offsets, keeping original.

## FORMATTING AND MANIPULATING TEXT

<b>Entering, importing, formatting</b>	<b>C</b>		<b>B</b>	
Text tool responsiveness	C	Program sometimes delays before responding to text entry.	A	Always reacts immediately.
Single-line text blocks	B	✦ Can avoid obtrusive tab ruler by creating text on a path.	A	Point text accommodates headlines and logos.
Em-, en-, and thin-space characters	A	✦ Same keyboard equivalents as in PageMaker.	F	Standard variable space only.
Insert line and column breaks	A	✦ Same keyboard equivalents as in Microsoft Word.	F	Hard returns only.
Import formats	C	✦ Text only and RTF.	A	✦ Text only, Word, MacWrite II, WriteNow, WordPerfect, and RTF.
Search and replace	F	No such function.	A	Can search for whole words; feature is case sensitive.
Location of character options	C	✦ Character options split between two palettes.	A	Everything is in Character palette.
View kerning information	C	✦ Hidden in Inspector palette.	A	✦ Information bar is useful for monitoring progress.
Prohibit hyphenation of selected word	A	✦ In character-level portion of Inspector palette.	F	Must force the word to the next line with a carriage return.
Control letters before and after hyphen	F	Not an option.	A	✦ Useful for centering hyphens and avoiding isolated syllables.
Type on a path	B	Characters can rotate or skew with path or remain upright.	B	Automatically avoids crimping and spreading characters.

## Paragraph-level formatting

Change justification from keyboard	F	Have to use commands or palette controls.	A	Just as in PageMaker or QuarkXPress.
Justify last line	A	✦ Conditional function affects only those lines that extend into Flush Zone.	B	Function is either on or off.
Control ragged-line width	A	✦ Can specify minimum length of shortest lines.	F	Ragged lines use standard spacing.
Hanging punctuation	C	✦ Ignores parentheses and en and em dashes.	B	Ignores parentheses.
Paragraph spacing	A	✦ Before and after spacing supported.	B	Can specify spacing before paragraph only.

## Lists and tables

Hanging indents	A	✦ Same as in a page-layout program.	C	Only via cumbersome text-wrap technique.
Tabs	A	✦ Permits multiple lines of type between tabs.	F	Usually treats tabs like carriage returns.
Paragraph rules	D	✦ Three-step, nonintuitive process.	F	Must be drawn manually.
Divide table into rows and columns	A	✦ Automatic row and column controls.	F	Columns must be separate text blocks; can't tab between them.

## Flowing text

Link text blocks	A	✦ Can link standard text blocks to text on a path.	B	Cloning block with direct-selection tool is convenient.
Reflow text inside linked blocks	C	✦ Must manually redraw links.	A	Change stacking order; rear text block is first in link.
Cut any block from link with text intact	C	✦ Cumbersome to separate an interior block.	A	Cut and paste.

## Block-level formatting

Format text by dragging handles	B	Applies to standard text blocks only.	F	Points around text block don't affect formatting.
First-line leading	A	✦ Nice touch.	F	Tightly leaded text may exceed top of text block.
Prevent widows at the top of columns	C	✦ In multicolumn blocks only; doesn't work across links.	F	Must eliminate widows manually.
Automatically shrink text block to fit contents	C	✦ Reduce text block (not rectangles) only.	F	Not available.

**Grade Key** ✦ = New or significantly altered feature. A = Works like a champ. B = Lacking in some respect, though still quite useful. C = Frustrating implementation; requires more work than it ought to. D = Barely usable, thanks to terrible implementation. F = Feature is absent.





**David Flaherty**, a New York City artist who uses Illustrator, created the original version of this image for the cover of a *BusinessWeek* advertising brochure in Illustrator 3.2; using Illustrator 5.0, he recently updated the image for inclusion in his portfolio. To create a shadow behind the globe inside the lightbulb on the far right, Flaherty used Illustrator 5.0's Drop Shadow filter. He used Illustrator's Star filter to create the shape behind the man's head.

To make the dollar signs inside the middle left lightbulb appear to be curving around the bulb, Flaherty used the Twirl command.

Flaherty created a radial blend for the numbers inside the leftmost bulb; by selecting all the numbers and filling them with the gradient, he was able to distribute the blend in each shape the same way.

Illustrator 5.0 introduced the concept of automatic copyfitting to drawing programs by allowing you to change the characteristics of a single-line headline set in a Multiple Master font so that the text fits onto a single line. Unfortunately, Illustrator doesn't warn you if the text block is too narrow or too wide for the function to work properly. FreeHand has a similar feature that expands and contracts letterspacing, but it's even less reliable than Illustrator's.

FreeHand 4.0 broadened the idea of copyfitting to incorporate an entire text block. FreeHand can automatically increase or decrease type size and leading to fit a block of text into the confines of a given space. You can also balance the number of lines of type between multiple columns. Unfortunately, this second function doesn't work across linked text blocks, an ability that might prove handy when formatting documents with two or more pages.

### Fills, Strokes, and Color

Illustrator takes the cake when it comes to automated gradations. Using the gradient tool, you can position the first and last colors of the gradation inside a filled object. You can also drag a single gradient across multiple selected paths. And if you click with the tool, you can adjust the focus point of a radial gradation so that the center of the fill is closer to one side of the radius than another.

FreeHand 4.0 lets you drag and drop colors onto objects to change their strokes and fills even when they aren't selected. Illustrator also lets you change the attributes assigned to deselected objects, but it means using a special tool (the paint bucket). Also, if you want to change fill and stroke attributes independently, you have to fiddle around with a bunch of dialog box options.

The good news about Illustrator's paint bucket is that it makes it easy to copy all attributes from one object and immediately apply them to another, regardless of how involved the attributes are. In FreeHand, your best bet is to save

the attributes to a graphic style, then apply the style to the second object—a four-step process.

In addition to providing outstanding gradient-fill options, Illustrator is alone in automating color adjustments. Using plug-in filters, you can blend colors across a series of objects, whether or not the objects were created with the blend tool. You can also invert the colors in an object, though the operation works by inverting cyan, magenta, and yellow values only; shades of black and white remain unaffected. And you can apply Pathfinder filters to combine paths so that it appears as if the colors of one object mix with those of the object behind it—a means of faking QuickDraw transfer modes with a PostScript printer.

Illustrator also provides filters for increasing and decreasing color saturation; at least, that's what these filters are supposed to do. In reality, they merely increase or decrease CMYK values, alternately darkening or lightening the colors. If the filters performed as advertised, you could decrease the saturation of colors to convert them to gray values or bump up the saturation to bring out stronger hues. As it is, these options are a wash.

### Output

Both FreeHand and Illustrator avoid PostScript printing errors by splitting

## TEN TASKS ILLUSTRATOR DOES BETTER THAN FREEHAND

- 1. Draw complex paths.** You can't help but create artistic stuff when the pen tool is such a work of art. Custom guidelines, point-alignment functions, and a first-rate information palette make creating complex paths even dreamier.
- 2. Create gradient fills.** With 32 colors, complete midpoint control, and the ability to exactly position beginning and ending colors inside objects, how could you go wrong?
- 3. Mask objects and images.** Only in Illustrator can you edit the contents of a mask without first taking the mask apart. You can also add paths to an existing mask in any order you please.
- 4. Experiment with automated effects.** Illustrator's new plug-in filters allow you to experiment with special effects in ways FreeHand doesn't permit.
- 5. Scale and rotate.** When it comes to scaling and rotating, Illustrator is tops. You can reuse a single origin, scale or rotate with respect to multiple independent origins, and transform and clone in a single operation.
- 6. Combine paths.** Illustrator's Pathfinder functions are more numerous and flexible than their equivalents in FreeHand (an FPU is required, though).
- 7. Format characters.** Illustrator allows you to change font, type size, leading, baseline shift, and other character-level formatting attributes without once moving your hands from the keyboard.
- 8. Select objects.** In addition to a slightly more flexible selection model that better accommodates simple shapes and masked elements, Illustrator provides filters for selecting objects automatically based on fill, stroke, or line weight.
- 9. Swap text with other programs.** Because Illustrator supports the Claris XTND system, you can import and export several common text formats.
- 10. Create graphs.** Illustrator's dedicated graphing tools make it one of the best programs for turning stagnant facts and figures into dynamic info arts.



# Drawing Distinctions (continued)

Grade FreeHand 4.0			Grade Illustrator 5.0		
Adjust text-wrap standoff	A	Specify negative and positive standoff values.	C		Via paragraph indents; no vertical spacing controls.
Inset type with respect to text-block outline	A	Specify negative and positive values are permitted.	F		Type always exactly fills text block.
Specify text-block dimensions numerically	A	Specify location, width, and height.	C		Only during creation by clicking with the rectangle tool.
Copyfitting text	B	Works automatically, across all links.	D		Must change type size and leading by hand.
<b>FILLS, STROKES, AND COLOR</b>			<b>B</b>		
<b>Defining fill and stroke</b>			<b>C</b>		
Tile patterns	A	Very straightforward.	C		Hard to define tiles, but 60 predefined patterns included.
PostScript and texture fills	C	Limited amount; don't display properly in preview mode.	F		Limited to tile fills.
Arrowhead editor	A	Draw your own in fully functioning editing window.	C		Scalable, predefined dingbat arrowheads.
Location of fill and stroke options	C	Scattered throughout the program.	A		Centrally located in Paint Style palette with room to spare.
<b>Gradient fills</b>			<b>A</b>		
Colors per gradation	C	2	A		32
Edit gradation in single deselected object	A	Drag and drop color to change color, angle, or center.	D		Can reassign only with paint bucket.
Adjust midpoint	D	Linear and logarithmic variations only.	A		Full midpoint control.
Create gradation between spot colors	F	Must create manually using blend feature.	A		Correctly outputs to color plates.
Name and save gradations	C	As styles only, which includes stroke definitions.	A		Program saves gradations with document.
Share gradations between documents	F	Not an option.	A		Useful when working on related illustrations.
Save gradations to library	F	No gradient libraries.	A		Just draw one of each and save file.
Position colors and focus point in radial gradation	C	Position beginning color only; no focus-point control.	A		Via gradient tool.
Draw gradation across multiple shapes	B	Must first combine shapes into composite path.	A		Select multiple objects, drag with gradient tool.
<b>Assigning attributes</b>			<b>B</b>		
Fill open paths	F	Must clone path, close and fill rear path, stroke front one.	A		Useful for creating indefinite boundaries.
Assign colors to deselected objects	A	Drag color onto fill or stroke of object.	C		Using paint bucket; must specify which attributes are affected.
Copy attributes from one object to another	C	Quickest method involves four steps.	A		Two clicks with the paint bucket.
Select objects according to fill or stroke	F	No automated selection functions.	A		Can even select masks.
Create a style sheet of attributes	B	Must have parent style.	F		Not possible.
<b>Color management</b>			<b>A</b>		
Color models	A	CMYK, RGB, HSL, and HSB (Apple).	B		CMYK and HSB (Apple).
Brand-name color libraries	A	Pantone, Trumatch, Focoltone, Toyo plus DIC.	A		Pantone, Trumatch, Focoltone, Toyo.
Import color	A	Can select colors you want to import from libraries.	B		Must import entire library.
Share colors between all open documents	F	No, but you can combine illustrations in one document.	A		Useful when creating multiple illustrations for one client.
Save color list to custom library	B	Must use special library format.	A		Any illustration functions as library.
Remove all unused colors	F	Not an option.	B		Automatically select all unused colors, then delete.
Color filters	F	Lacks color filters.	B		Blend colors according to position or stacking order.
<b>Masks (clipping paths)</b>			<b>B</b>		
Mask retains fill and stroke	A	This is the way it should be.	D		Restore with filter, though this complicates editing process.
Edit paths inside masks	F	Must cut contents first.	A		Highly versatile feature.
Add paths to existing mask	C	Can only add to front of mask.	A		Can paste in front or in back of any element inside mask.
Use editable text as mask	D	Rectangular text-block outline serves as mask.	A		Characters serve as mask.
<b>OUTPUT</b>			<b>C</b>		
<b>Printing paths and halftones</b>			<b>C</b>		
Split long paths	A	Splits in memory and in EPS definition.	D		Permanently splits paths in document.
Flatness	A	Global flatness now saved with EPS file.	C		Control indirectly using Output Resolution option.
Custom halftone frequencies and angles	A	Specify on object-by-object basis.	D		Apply to entire document using Separator utility.
Control steps in printed gradation	A	Useful for printing quick drafts.	F		No draft setting.
Tile large artwork	C	Must rely on less-satisfying Overlap options.	A		Control exact placement of tiles.
<b>Color separations and composites</b>			<b>B</b>		
CIE monitor and ink calibration	F	Not an option.	A		Borrows settings from Photoshop.
Print color separations	A	All options available from inside FreeHand.	B		Must leave Illustrator and launch Separator utility.
Move document on printed page	F	Must move objects or page instead.	A		From inside Separator.
Add and move crop, registration marks	C	Assign custom registration mark via Color List palette.	A		From inside Separator.
Transfer functions	B	Must customize by editing PPD.	B		Fully customizable, but lacks presets.
Ships with LaserWriter driver 8.0	A	Ships with standard product.	C		Included in CD-ROM version only.
<b>DOCUMENTATION AND PRICING</b>			<b>B</b>		
Manuals and online help	C	Many features ignored in manual.	C		Includes expert techniques, no help available.
Technical support	B	Two wordy voice-mail menus before entering queue.	C		Must go through exhaustive voice-mail menu system.
List price/upgrade	A	\$595/\$150	A		\$595; \$695 for CD-ROM/\$199; \$249 for CD-ROM
<b>OVERALL GRADE</b>			<b>B</b>		

**Grade Key** ♦ = New or significantly altered feature. A = Works like a champ. B = Lacking in some respect, though still quite useful. C = Frustrating implementation; requires more work than it ought to. D = Barely usable, thanks to terrible implementation. F = Feature is absent.





**Chris Spollen** used Illustrator 5.0 to create this piece, titled "The Wonder of Innovation."

Spollen created a palette of gradients and saved them for later use. He experimented with all the different gradients, using multiple levels of undo to easily switch between them.

Spollen used a yellow-red gradient for each section of the lightning bolt. First he selected the lightning bolt and selected a linear gradient; after selecting the bottom section, he clicked on the bottom point and used the gradient vector tool to drag the gradient from bottom to top (red to yellow) and then did the same for the middle and the top sections. He customized the gradient inside the gear to blend from yellow to red to yellow.

overly long paths and flattening out complex curves. While FreeHand splits paths in memory and never alters the original document, Illustrator breaks up paths for good when saving and printing, making for some pretty ornery editing sessions. Illustrator has also abandoned the reliable Flatness option for the less straightforward Output Resolution option, which can result in jagged paths when you least expect it.

Some Illustrator 5.0 users have reported being unable to print illustrations containing gradients to some laser printers, imagesetters, and color printers. But the recently released 5.0.1 patch seems to have solved most of these problems. The patch was sent free to all registered 5.0 users and was also posted on

expert techniques for advanced users. FreeHand's manuals used to be great, but they have suffered in the translation to version 4.0. Many options are described in one sentence or ignored entirely. Complex tasks are treated so briefly, you're frequently left scratching your head.

FreeHand's online help is not much help. If your system is equipped with PostScript font metrics, the text extends beyond the margins of the help window, regardless of how you resize it. Furthermore, the window does not stay on screen while you try out a feature. Quite honestly, I would rather see FreeHand abandon online help and integrate the information into the manuals instead, as Illustrator has done.

### Redraw and Performance Speed

Back when Illustrator prohibited editing in the preview mode, some users wondered if Adobe was simply waiting until it could make its screen redraw faster than FreeHand's. But with Illustrator 5.0, we can stop speculating—Macworld Lab tests show FreeHand as the overall winner (see "Putting FreeHand and Illustrator to the Test").

Thankfully, neither program encountered printing errors, and FreeHand printed our two test files in 380 seconds—50 percent faster than Illustrator (at 596 seconds). FreeHand was also faster than Illustrator at redrawing the entire screen

CompuServe, America Online, and Adobe's own bulletin board.

When it comes to printing your color separations, Adobe's Separator utility provides more functionality than FreeHand's built-in Print command. If you are armed with a densitometer, you do have specific control over transfer functions when you use Separator; FreeHand, however, limits you to a few presets.

### Documentation

The documentation included with Illustrator 5.0 is first-rate. It includes a tutorial, a user's guide, and a separate volume of

—as when zooming or scrolling in large increments—sometimes by as much as 300 percent. For example, FreeHand took 17 seconds to redraw the page-layout document; Illustrator took 59 seconds.

FreeHand and Illustrator took similar amounts of time to perform a suite of common operations in preview mode; Illustrator generally monitored the operation more quickly, but FreeHand made up the difference when redrawing the results. The only case in which Illustrator performed significantly faster than FreeHand was when performing operations in Keyline (FreeHand) or Artwork (Illustrator) mode; in these tests, Illustrator consistently beat FreeHand by 200 percent or more.

### Which One's for You?

After examining every nook and cranny of these two powerful programs, I've discovered that—this time around—there is no decisive knockout punch.

If you're not yet locked into one program, though, there are some subtle differences that you'll want to consider. Illustrator is geared toward advanced artists who need precise gradient controls, feel comfortable working in the Artwork mode, find inspiration in experimenting with transformations and special effects, and don't plan on importing images from any program but Adobe Photoshop.

Despite FreeHand's reworked palettes, Illustrator also continues to win my vote as the easier program to use because it does a better job of structuring options in an organized fashion (the one exception being the completely random Filters menu) and making those options available when you need them.

If, on the other hand, you're more interested in creating and printing small documents, editing and copyfitting text and tables, and importing and editing TIFF images, FreeHand is the better of the two. Also, if sheer speed is important, then consider FreeHand.

The two programs are so evenly matched, yet with different strengths, that you might be tempted to buy them both (provided your software budget allows). Let me give you a word of advice, though: Don't. The two programs are similar enough that you should be able to make do with one or the other without much compromise, and there is little that can be done in one program that absolutely cannot be accomplished in the other. ■

DEKE MCCLELLAND spends most of his time writing books on graphics software, including *The Illustrator 5 Book* (Peachpit Press, 1993), *Macworld FreeHand 4.0 Bible*, and *Macworld Photoshop 2.5 Bible* (both IDG Books Worldwide, 1993).





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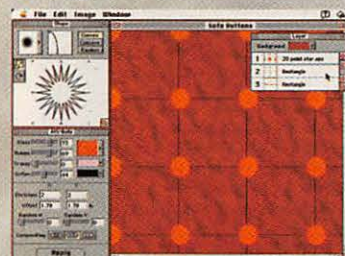
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Circle 41 on reader service card



# At Work

## Pillar to Support Financial Analysis

Pillar expects to ship FYControl 1.0 in May. Because FYPlan and FYControl require several hierarchically integrated pieces of software, their pricing structure is complex. FYPlan costs about \$20,000 for the first five users and about \$500 for each additional user; the FYControl add-on is slightly less expensive. Pillar, 415/349-6200.—D.L.



PowerAgent doesn't provide Open Sesame's ability to analyze the tasks you perform on your Mac and then offer to take over doing them for you; instead, you use a point-and-click dialog-box inter-

Inventory - Check Inventory

Pass Alert

Stop Sound Show Web Site Load Start to:

**Inventory Check:**

You are running out of the following items.  
Please re-order as soon as possible.

Item	Stock	Min Stock	Order	Order Number	Order Date
Item #1	Stock: 10	Min Stock: 5	Order: 100	Order Number: 123456789	
Item #2	Stock: 20	Min Stock: 10	Order: 200	Order Number: 987654321	

Preview Finger Choices Cancel OK

DAVID KAMU



for including any FileMaker Pro feature in a Job, and SouthBeach is adding support for other AppleScript-savvy applica-

tions. Upgrade plans were not set at press time. SouthBeach Software, 305/858-8416, 800/492-7753.—D.L.

## The Electronic Routing Slip

**B**LUERIDGE TECHNOLOGIES HAS UPgraded its client-server document-processing system, Optix Workflow, with tools that enable a user to designate the route a document travels through an office using a point-and-click graphical route developer. Designed to replace the bottleneck-ridden flow of paper documents, Optix Workflow can send documents across a local or wide area network.

Workflow 1.0 required command-line programming. In version 2.0, users can design routes by drawing lines between icons representing users; routes can be designed for such contingencies as skipping someone who fails to acknowledge a document's arrival. Documents can originate in electronic format or be scanned into Blueridge's Optix Network,

a document-archiving system.

Workflow pricing begins around \$50,000 for an office; with Network, pricing begins around \$75,000. Blueridge Technologies, 703/675-3015.

—JOANNA PEARLSTEIN



## Document Conferencing on the Network

**C**OMPUTER USERS WHO NEED TO collaborate may find a solution in Crosswise Corporation's Face to Face, document-conferencing software that lets Mac and Windows users create images of their documents with a special printer driver and then view and edit them together from different locations.

Face to Face is \$295 for a two-user pack and can connect two users at a time via high-speed modem, ISDN line, or AppleTalk network. Face to Face can also recognize a user's PowerTalk directory.

Face to Face has tools for navigating, drawing, erasing, and creating text. Each participant's comments are displayed on a separate transparency-like layer over the document. After conferencing is complete, participants can save, print, or forward the edited document.

Unlike videoconferencing, Face to Face requires no special hardware. Crosswise envisions Face to Face as a replacement for faxing or mailing documents that are later discussed by phone—Face to Face users can talk on the phone while viewing and editing the electronic files. Crosswise, 408/459-9060.

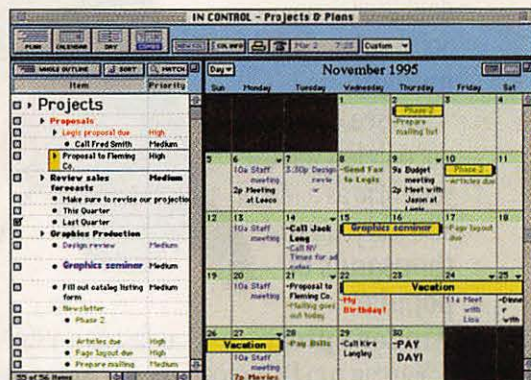
—JOANNA PEARLSTEIN

## Control with Flexibility

**A**TTAIN CORPORATION'S In Control outliner/planner is being upgraded to version 3.0, with support for modifying how information is presented, as well as a long list of incremental improvements.

In Control now has four views that can be reconfigured extensively—for example, you can display the weekly calendar and the new to-do list side by side under the outline. You can also set how many weeks appear in the weekly calendar, and how many months in the new monthly calendar. A new daily calendar allows you to schedule your time hour by hour. The calendar views also provide banners—icons running across multiple days or weeks showing the duration of an event.

In Control 3.0 supports recurring events. Recurring events, like other dated events, are automatically included in the



In Control 3.0 allows users to create custom views that combine the structured, outline-based to-do-list manager with day, week, and month calendars.

new Appointments and To-Dos columns in the outline view; the two columns are normally hidden, to avoid cluttering the outline, but can be used to sort and select topics. In Control 3.0 should ship in May and will probably list for \$129.95. Attain, 617/776-1110, 800/925-5615.—D.L.

### IN BRIEF

#### ■ Interleaf's New Leaf?

Unix publishing software vendor Interleaf is renewing its on-again, off-again relationship with the Macintosh, the highlights of which include shipping and then dropping a Mac version of its flagship publishing system, and quietly shipping an electronic-document-viewing tool that is similar to Adobe Acrobat and No Hands Software's Common Ground. Now Interleaf has returned with plans for a Macintosh client to Intellect, which integrates the assembling of structured documents, electronic distribution and viewing, and workflow controls in a client-server system. 617/290-0710.

#### ■ Multiplatform Sales Software

SalesKit Software has announced Mac versions of its sales-automation products, SalesKit and SalesKit Administration Program (SAP). SalesKit can share information among Macs and DOS and Windows machines, as well as with databases stored on larger systems. SAP allows users to modify SalesKit's features. 314/432-7205.



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BY JIM HEID

# Working Smart

## Power Tips for LaserWriter 8

POSTSCRIPT PRINTER PERFORMANCE HAS improved dramatically over the last decade, thanks to faster print engines and faster processors. And the Macintosh's PostScript printer driver—the program that enables the Mac to communicate with a PostScript printer and that you access by clicking on its icon in the Chooser—has also evolved.

The latest driver, called LaserWriter 8 by Apple, and Adobe Printer Driver PSpinter by Adobe Systems—Apple and Adobe collaborated on the driver's design—provides better all-around printing performance and supports PostScript Level 2 machines. (PostScript Level 2, which most new PostScript printers use, is faster than the earlier PostScript and manages the printer's memory better, among other things. But many of LaserWriter 8's special features are accessible even with older PostScript printers.)

Some of LaserWriter 8's enhancements are aimed at users of color printers and imagesetters, but many of its enhancements are also useful for the Macintosh in a gray flannel suit. For example, the driver can add options to the page-setup and printer dialog boxes that let you access special features found in many printers, such as enhanced resolution, support for multiple paper trays and fax-modem cards, and even duplex mechanisms (which flip paper inside a printer to print on both sides of a page). The key to LaserWriter 8's ability to support unique printer features is each printer's printer description file (PDF), a description of the printer's capabilities—its resolution, paper-handling features, and so on—which LaserWriter 8 reads. (PDF files, also called PPDs, or PostScript Printer Descriptions, reside in the Printer Descriptions folder inside the System Folder's Extensions folder. See the screen image "More Choices Dialog").

This month's column is a guide to the ways business users can take advantage of LaserWriter 8. The most recent version is 8.1.1; its primary improvements to ver-

sion 8.0 include better TrueType support, better compatibility with Mac applications, improved support for Apple's ColorSync color-management system, and fax logging for fax-equipped printers. If you're using an earlier version of the driver, you can get the PSpinter driver package with documentation for \$24.95 from Adobe Systems (415/961-4400, 800/833-6687). The driver package includes PDFs for many printers; printer vendors usually supply only the PDFs for their own printers, so if you need additional PDFs—perhaps to create print-to-disk files for an imagesetter or other printing device that you don't

bins (see "Tray Chic: Paper-Handling Options"). LaserWriter 8 lets you tap these trays in several ways. Two or more trays make it easy to mix and match paper stocks without walking over to the printer and sliding trays in and out. In an office, multiple bins can help you avoid situations such as one person installing transparency stock just as another person begins a 48-page print job.

Here are several ways you can put two trays to work.

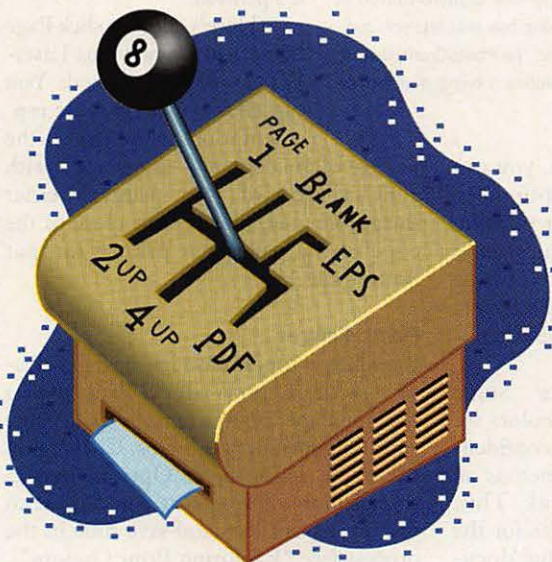
- **Multipage business letters** Put letterhead in the upper tray and second sheets in the lower one. Then, in the Paper Source area of the Print dialog box, choose Upper for the first page, and Lower for the remaining pages (see "Paper-Feeding Controls"). Here's a variation of this technique for a printer that has one paper cassette and one multipurpose tray, such as Apple's LaserWriter Pro series. Put second sheets in the cassette and letterhead in the multipurpose tray. Then select First From Multipurpose Tray and Remaining From Cassette. If the majority of your letters are only one page, you should reverse this scheme.

- **Printing rough proofs**

Put el-cheapo copier bond in the upper tray and high-quality laser paper in the lower one. When you're proofing a document for typos and errors in the layout, use the upper tray. When you're ready for final output, use the lower one.

- **Paper and transparencies** Put laser stock in one tray and transparency stock in the other. (Check the box your transparency stock comes in to verify that it can be fed automatically—some transparencies must be manually fed.) If your

*continues*

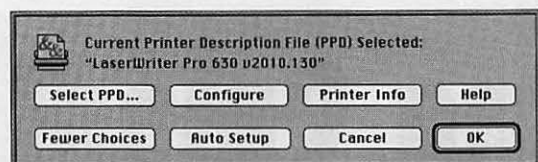


have—you'll need Adobe's library of PDFs. The driver also comes with the CD-ROM versions of many Adobe products, including Photoshop, Illustrator, and Premiere. (If you don't know what driver version you have, select the driver—it's in the Extensions folder inside the System Folder—and choose Get Info from the File menu.)

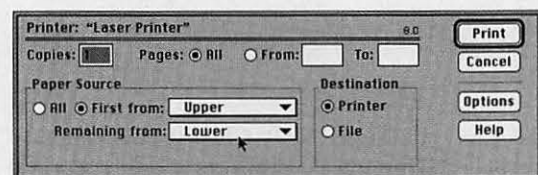
### Pick Your Paper

More and more PostScript printers include or accept optional multiple paper

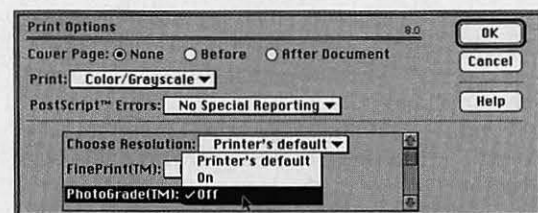




**More Choices Dialog** This dialog box, which you access by clicking on More Choices in the Printer Setup dialog box, lets you manually select a different PDF (also known as PPD). You might do this when preparing a print-to-disk file using the driver for an imagesetter or color printer that you don't actually have.



**Paper-Feeding Controls** The Paper Source pop-ups in LaserWriter 8's Print dialog box let you mix and match paper within a print job. Here, the first page of a document will be printed using the paper in the printer's upper tray, while the remaining pages will use the paper in the lower tray.



**Exploring Print Options** Clicking on the Options button in the Print dialog box reveals another dialog box that lets you control features unique to each printer. Here, the PhotoGrade feature that is provided by many Apple LaserWriters is being disabled for faster printing.

printer has just one paper bin, you can still use the Paper Source options to streamline switching stock. For printing multipage business letters, put second sheets in the paper tray. When it's time to print, choose Manual for the letterhead page and Auto Select for the remaining pages.

- **Color-code documents** Some businesses use different paper colors for common document categories: confidential documents on blue stock, memos on yellow paper, price lists on pink. This, combined with company policies for the color coding—for example, blue documents are never to leave the engineering department—makes paperwork a bit easier to track and manage.

- **Long print jobs** Multiple paper trays not only let you switch between stocks, they can also cut down on refilling trays when you're churning out copy. Fill both bins with the same paper and tell the printer to switch to the second bin when the first runs dry. This is generally the preset option unless you specify otherwise using the printer's front-panel controls.

## Printing Thumbnail Pages

LaserWriter 8's Page Setup dialog box contains a pop-up menu called Layout that lets you reduce two or four pages and print them on a single sheet of paper with a black border around each page. You can use this feature to save paper and toner when you're printing simple documents such as text manuscripts or E-mail messages. You'll be surprised at how readable the text remains when it's reduced, especially with two-up printing. Text printed in four-up mode is a bit small—if the bottom rows of an eye chart give you trouble, don't go any smaller than two-up.

The thumbnail option is also a handy way to reduce large documents and save room in your filing cabinet, and it's great for storyboarding your presentations. And for you desktop publishers, two-up printing is a good way to gauge how a two-page spread will appear when it's printed.

(Here's another slick Page Setup feature previous LaserWriter drivers lacked: You can click on the graphic representation of the page—the picture of the dogcow—to replace it with a description of your printer's exact imageable area, that is, how close to the edge of the page your printer can put down toner.)

## Print Power

I've already touched on the best new feature of the LaserWriter 8 Print dialog box: the Paper Source options that enable you to bounce between bins. Clicking on the Print dialog box's Options button reveals more options that you can use to fine-tune print jobs and save time in the process (see "Exploring Print Options").

If you're proofing a document that contains scanned images or illustrations with color or gray shades, you can shorten your printing times—often dramatically—by choosing the Black & White option instead of Color/Grayscale. In a similar vein, if your printer has a halftone-enhancement feature such as Apple's PhotoGrade, you can probably reduce printing times by disabling it: click on Options, locate the PhotoGrade pop-up menu, and choose Off. (However, disabling a text-enhancement feature—for

example, Apple's FinePrint or Hewlett-Packard's Resolution Enhancement technology—generally does not save on printing time. Here's another efficiency tip. Some color printers still ship with LaserWriter 7.X because printer vendors know that the way LaserWriter 8 saves a job to disk before printing it temporarily uses more disk space than LaserWriter 7.X. To avoid running out of disk space when printing huge files, you might want to keep the old driver installed, using the Chooser to switch between it and LaserWriter 8 as needed. You can mix LaserWriter 8.X and LaserWriter 7.X on a network without problems.)

Options you choose in the bottom portion of the Print dialog box revert to their original, printer-resident settings after you print one document. For instance, if you disable PhotoGrade to get faster output of a given document, the printer reenables PhotoGrade after printing the document.

## What's Your Destination?

LaserWriter 8's Print dialog box has buttons in an area labeled Destination that let you send a document to the printer or to a disk file. Desktop publishers often create a raw PostScript disk file when they plan to send documents to a service bureau for high-resolution imagesetter output—the process eliminates the need for the service bureau to have the application that created the document.

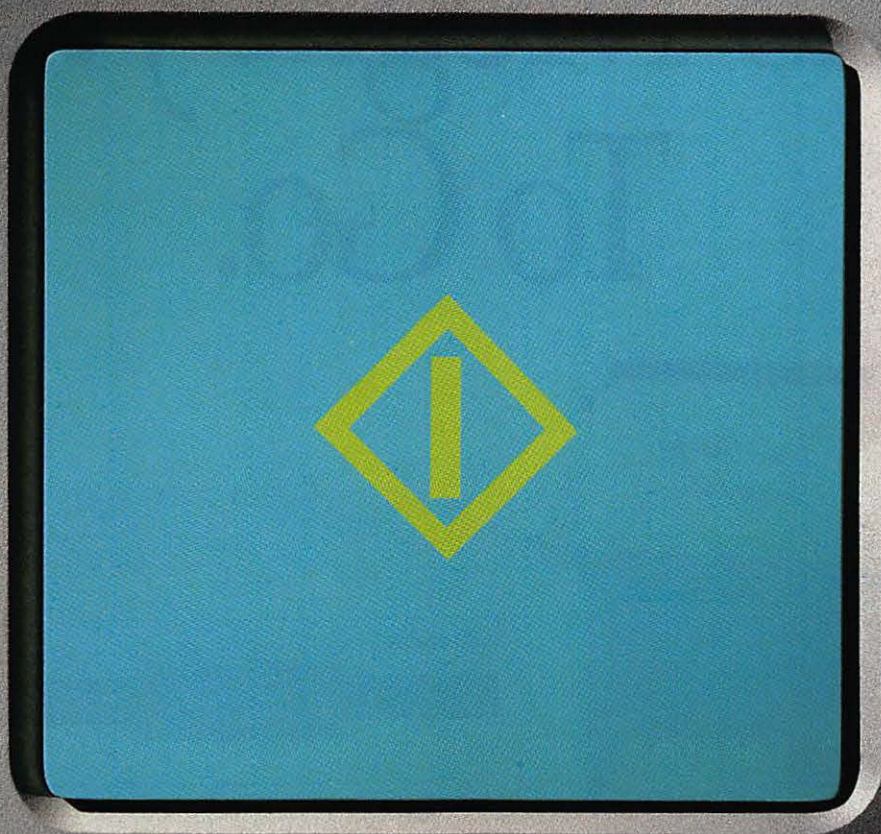
LaserWriter version 8.1.1 builds on the print-to-disk feature with an option to create an encapsulated PostScript (EPS) version of a single page within a document. You could use this to create a page-within-a-page effect—for example, to include a page from a report on a presentation slide. The print-to-disk feature makes it possible to export an EPS image from programs that don't provide EPS export.

In the Destination area of the Print dialog box, click on the File button (notice the Print button changes to read Save). In the Pages area of the dialog box, specify the page number of the page you want to save as an EPS file. When you click on the Save button, you'll get a Save dialog box with two EPS Mac options (the EPS Mac Enhanced option yields better results but uses more disk space).

By the way, if your printer contains a PostScript fax card, the Destination area has a third button, for faxing the document. LaserWriter 8.1.1 logs outgoing faxes. (The LaserWriter Select 360 PostScript Fax Card sells for \$309. The LaserWriter Pro 810 PostScript Fax Cartridge sells for \$309. For more information on

*continues*





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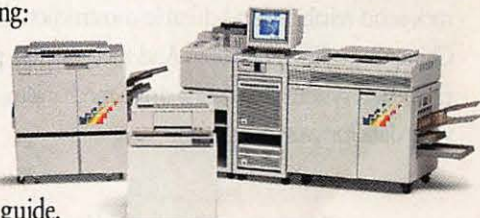
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## TRAY CHIC: PAPER-HANDLING OPTIONS

Here's an overview of special paper trays available for Apple's LaserWriter line; equivalent options are available for most third-party printers. Besides Apple, Hewlett-Packard, Texas Instruments, QMS, and Lexmark generally offer the widest array of paper-handling add-ons.

- For the LaserWriter Select 360, Apple offers the LaserWriter Select 250-Sheet Feeder w/Cassette (\$149). Apple also offers the LaserWriter Select 30-Envelope Cassette (\$89); the LaserWriter Select 250-Sheet Legal Cassette (\$79); and the LaserWriter Select Multipurpose Tray Option (\$25), which holds 50 sheets or 5 envelopes.

- The LaserWriter Pro 600 and 630 are complemented by the LaserWriter Pro 500-Sheet Feeder (\$399) and the LaserWriter Pro Envelope Feeder (\$399), which holds 75 envelopes.

- Apple's LaserWriter Pro 810 can shuffle paper better than a bureaucrat, boasting three 250-sheet trays as standard equipment. The optional LaserWriter Pro 810 Automated Media Feeder (\$359) holds 15 envelopes or 100 sheets of transparency media or card stock.

- The now-discontinued Personal LaserWriter NTR had one 50-sheet multi-purpose tray. Apple still sells the Personal LaserWriter 250-Sheet Cassette Base (\$99) as well as the Personal LaserWriter Letter Cassette (\$65), the Personal LaserWriter Legal Cassette (\$65), and the Personal LaserWriter Envelope Cassette (\$75).

- Datasource (404/451-0257, 800/676-3962) sells TowerFeed multibin add-ons for the LaserWriter Pro 600 series and the discontinued LaserWriter II line (the IINT, IINTX, IIf, and IIg). The TowerFeed 444 is available in several configurations: the Model 33 (\$1995 for LaserWriter II's, \$2195 for the LaserWriter Pro 600s) provides three 500-sheet trays; the Model 44 (\$2395 for LaserWriter II's only) provides four trays; the floor-standing Model 75 (\$3745 for LaserWriter II's, \$3945 for the LaserWriter Pro 600s) provides five trays in addition to two storage drawers. All include enhanced driver software for switching between several trays and giving trays descriptive names such as "Letterhead" and "Rough Drafts." TowerFeed models are available for other brands of laser printers, and Datasource also sells less expensive devices for such tasks as feeding large quantities of envelopes or stacking printer output.


PostScript faxing, see last October's *Working Smart* column.)

### Modifying LaserWriter 8

While exploring America Online, I found a utility that can perform several modifications to the LaserWriter 8 driver. Printer Defaults 1.1.1, a free utility created by John Rawnsley, can modify the driver to not print page borders in the two-up and four-up modes; to limit the maximum number of copies you (or people whose Macs you administer) can print; to add a two-up or four-up pop-up menu to the Print dialog box; to not require AppleTalk to be active (for generating print-to-disk files when you aren't connected to a network); and much more.

If you're comfortable working with Apple's ResEdit utility (version 2.1.1, \$29.95 with documentation; APDA, Apple, 716/871-6555, 800/282-2732; free online and from most user groups), you can perform several more modifications, including adding the ability to print more than four thumbnails on a page. (This can be handy if you have an 11-by-17-inch printer.) You'll find instructions in a file

named LaserWriter 8.x Hacks & Patches 1.1, created by Don Markuson. But don't modify your only copy of the driver. Make a duplicate and modify the copy instead—cheap insurance in case you do something to scramble it. Also, if you're in charge of a network, you might give all users a copy of the modified driver so that everyone has the same printing options.

You can locate Printer Defaults 1.1.1 or Don Markuson's modification instructions using America Online's file finder (search for the text *LaserWriter 8*). Or just visit the Macworld Online forum on America Online. If you use either of the files—or if you come up with additional tricks for LaserWriter 8—drop me an E-mail and share your experiences. My AOL address is JIMHEID; on CompuServe, I'm 76174,556. 

NEXT MONTH: Time Billing

Contributing editor JIM HEID is the author of *Macworld Complete Mac Handbook Plus CD* (IDG Books Worldwide, 1993). His newest book, *Macworld Word Companion Special Edition*, a hands-on guide to Microsoft Word 6, will be available when Word 6 ships.

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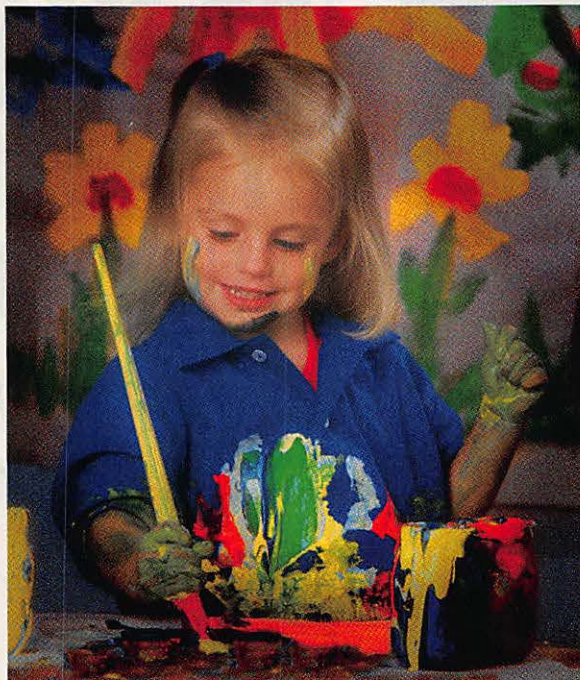
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BY LON POOLE

# Quick Tips

## Tips, Tricks, and Shortcuts

EVERYONE KNOWS HOW TO LOCK A FILE with the Finder's Get Info command, but how do you lock a folder? It's easy with System 7, says Marc Robinson of Philadelphia. Just select the folder you want to lock, choose Sharing from the Finder's File menu to bring up the folder's file-sharing privileges window, and in it check the box labeled "Can't be moved, renamed or deleted." You don't have to actually share the folder or change any other settings in the privileges window. For this trick to work, System 7's file sharing must be on; the Sharing command tells you to turn it on with the Sharing Setup control panel if necessary.

### Sound Improvements

**Q.** How can I upgrade my Mac IIci to the same sound capabilities as the latest Mac models?

*Frank A. Cuomo  
Gadsen, Alabama*

**A.** You can get the CD-quality audio input and output (stereo 16-bit sound sampled at 44.1kHz) that comes on the 660AV and 840AV as well as every Power Mac by installing the Pro Audio-Spectrum 16 Mac, a \$495 NuBus card from Media Vision (510/770-8600 or 800/845-5870). An LC version is also available for \$395. These products include a multisource analog mixer, a 20-voice stereo synthesizer, and MIDI input and output; no Mac's built-in audio has these features.

You can also improve the operating system's handling of sound by installing Sound Manager 3.0 (available from online services or as part of Apple's System Update 2.0.1 from the Apple Order Center, 800/769-2775, ext. 6717, for \$10). Sound Manager 3.0 includes a system extension and a new Sound control panel. You must have System 7.0 with QuickTime, System

7.1, or a later version of system software. It works on all Macs except the classic-style hardware such as the Macintosh Plus, SE, and Classic.

Here's a rundown of Sound Manager 3.0's main improvements according to Apple: Sound Manager 3.0 is more efficient than previous versions and makes audio sampled at 11kHz sound much better. As a result, applications can play more sounds simultaneously and QuickTime movies sound better. With Sound Manager 3.0 installed, you can boost the volume of a QuickTime movie by pressing the option key while adjusting the volume



control in the QuickTime movie controller. On monophonic Macs like the LC, Sound Manager 3.0 blends the left and right channels of a stereo signal instead of playing only the left channel. A true square-wave tone generator lets you hear the Simple Beep alert sound the way it was designed to sound. You hear fewer clicks and pops in general, and other bugs have been fixed.

### Disk-Space Wasters

**Q.** I copied a folder with 2134 alias files from one hard drive to another. The Get Info command shows that the size of the folder doubled from 2.7MB to 5.4MB, while the byte count remained the same (1,028,378 bytes). What gives?

*George Kopecky  
Honolulu, Hawaii*

**A.** Undoubtedly the folder size increased because the destination drive had a larger capacity than the source drive. The Mac file system allocates a minimum amount of disk space for each file regardless of its actual contents. The minimum file size for a particular disk is set when it is formatted (or when it is partitioned, if it has multiple partitions), and increases incrementally as disk (or partition) capacity increases. Most formatting programs set a minimum file size of 1K on disks with capacities of less than 64MB, 1.5K on disks with capacities of 64MB to 95MB, 2K on disks between 96MB and 127MB, and so on. Thus 2134 files would take at least 2.1MB (2134K) on a 40MB hard drive but 4.2MB (4268K) on a 120MB drive. Allocating disk space in smaller chunks than these would

decrease hard drive performance.

The byte count doesn't change when you copy files because it measures the amount of space actually used, not the amount allocated. Typically an alias file uses less than the amount allocated even on a small hard drive; unfortunately the unused part of the allocated space is wasted. Your 2134 alias files, which use a total

*continues*



of about 1MB (1,048,576 bytes), waste 1.6MB on your smaller drive and 4.1MB on your larger drive. To reduce this kind of waste, use a disk-formatting program to partition your large drive, and then keep small files like aliases on partitions smaller than 64MB.

### Avoiding Inverted Records

**TIP** 4th Dimension's Array to Selection command does not always work as you might expect. If you use the command to copy an array to an empty file (a file that has no records), the records created contain an upside-down image of the array; that is, the first record contains the value of the last array element, and so on. This behavior is undocumented. You can get around it with a 4D procedure that first creates a number of blank records equal to the number of elements in the array (using a For loop and the Size of Array function); then selects all records in the file (using the All Records command); and finally copies the array elements, in order, to the newly created blank records (using the Array to Selection command). Alternatively, you can simply reverse-sort the array before executing the Array to Selection command. This works only if the array is already sorted and you don't mind changing the order of the array.

Kablid Goma  
Cairo, Egypt

While these methods may work for you, ACI US technical support warns that record order is never guaranteed in 4th Dimension, and record order is especially vague if you've deleted records to make a file empty, because 4D tries to reuse the space once occupied by deleted records. The only reliable way to arrange records in a particular order is to sort them. To achieve your goal, you would save the value of an array element in one field of each record and the corresponding index number of the array element in a separate sort-key field. Then you could sort the file by that sort-key field to arrange the records in the same order they had in the array.—L.P.

### Rotating Oblong Images

**TIP** If you open a horizontal image in Fractal Design Painter 2.0a (with or without Painter/X2) and then rotate the whole image to a vertical orientation, Painter crops the now-vertical image to fit the original horizontal image area. This cuts off a lot of image! By following these steps you can get a perfectly rotated vertical image:

1. Open the image, check its dimensions with the Resize command, and note its horizontal dimension.
2. Open a new square document with dimensions slightly larger than the horizontal

continues

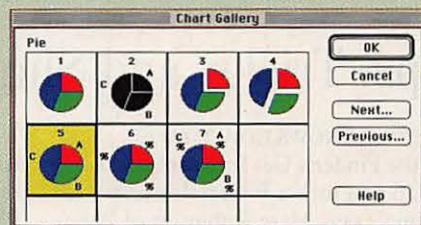
## IMPOSSIBLE PIE

Once in a while in Microsoft Excel you may need a multiple pie chart of the type shown here. You could create two charts, copy them to a draw program, and assemble a composite there, but Shane Devenshire of Walnut Creek, California, has devised a trick for creating the compound chart in one chart document.

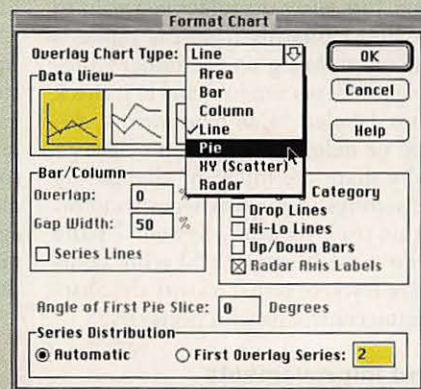
1. Start by entering two columns of data and including an extra row with dummy data whose values are much larger than the other entries. Then select the data and use the New command to create a new chart document.

Fruit Sales Worksheet			
	A	B	C
1	Fruit Sales by Year		
2		1992	1993
3	Apples	10	13
4	Peaches	19	23
5	Pears	11	9
6	Plums	16	27
7	Oranges	14	5
8	Pineapples	17	16
9	Bananas	13	7
10	dummy data	50	50
11			

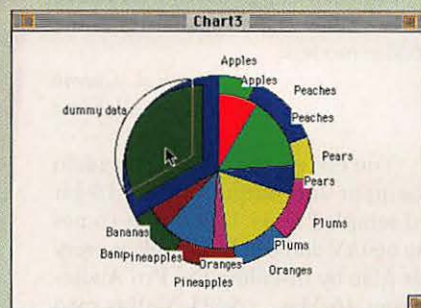
2. Choose Pie from the Gallery menu, and in the dialog box that appears double-click pie chart style 5. This creates a pie chart for your first column of data, with each pie slice labeled.



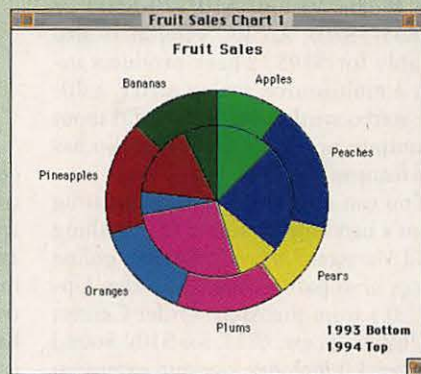
3. Choose Add Overlay from the Chart menu, creating a line-type overlay chart for the second column of data. To change the overlay to a pie chart, choose Overlay from the Format menu. In the dialog box that appears, choose Pie from the Overlay Chart Type pop-up menu and click OK.



4. Select the dummy data pie slice from the overlay pie and drag it away from the pie center. This shrinks the overlay pie, revealing the main pie underneath. You can shrink the top pie more by dragging the slice farther out, or enlarge the top pie by dragging the slice closer to the center.



5. Remove the dummy slices from both pies by switching to the spreadsheet window and clearing the dummy data row. Switch back to the chart window and change the pie-slice colors on the overlay chart to match the colors on the main chart. (To change a slice's color, double-click the slice to bring up the Patterns dialog box, and there choose a color from the Foreground pop-up to match the slice for the same data category in the main chart.) Remove the slice labels on the overlay chart, which duplicate the labels on the main chart, by selecting each label in turn and using the Clear command. Finally add a chart title with the Attach Text command, and add a legend as unattached text.





# Introducing Proxima's Portable 10-Foot Monitors

The image shows a man in a dark suit and tie standing next to a large projection screen. He is holding a thin black pointer stick and pointing at a pie chart on the screen. The screen displays a software interface with a menu bar at the top containing 'File', 'Edit', 'View', 'Label', and 'Special'. Below the menu bar, the word 'Projection' is written in large, pink, stylized letters. To the left of 'Projection', the word 'LCD' is written in green. Below 'Projection', the word 'BENEFIT' is written in white. In the center of the screen is a 3D pie chart with three segments: a yellow segment labeled 'Green Solution', a red segment labeled 'Lower Media Costs', and a green segment labeled 'Increased Productivity'. To the left of the pie chart is a video player window titled 'Multimedia Video' showing a race car with the number 12. Below the video player are four navigation buttons: a left arrow, a right arrow, a double right arrow, and a square button. At the bottom of the screen are four icons: a magnifying glass, the word 'INFO', a person icon, and a speech bubble icon. The man is smiling and looking towards the camera.

With Proxima's desktop projection products, you can now project computer and video images as large as 25 feet! And that means you can take advantage of the productivity-enhancing power of your personal computer to make your presentations, business meetings, training, and interactive workgroup sessions more effective.

Simply connect a Proxima Desktop Projector™ to your PC or Mac and instantly deliver dynamic color graphics...crisp data...brilliant video. Or place one of our LCD projection panels on an overhead

projector, plug it into your computer, and—presto!—the benefits of the giant screen are yours.

From our MultiMode® and active-matrix Ovation™ projection panels to our dazzling new Desktop Projectors and our remarkable Cyclops® cordless-mouse pointer, Proxima has created a whole new way to showcase your ideas and imagination—starting at less than \$1,600!

So call us for more information.



**PROXIMA®**

PROJECTING THE POWER OF YOUR COMPUTER IN THE MEETING ROOM.™

CALL NOW TOLL-FREE

**1-800-447-7694**

Proxima Corporation 9440 Carroll Park Drive, San Diego, CA 92121-2298, (619) 457-5500. In Europe: Horsterweg 24, 6191 RX Beek, The Netherlands, +31-43-650 248. Proxima, MultiMode, and Cyclops are registered trademarks and Ovation, Desktop Projector, and Desktop Projection are trademarks of Proxima Corporation. Other trademarks are the property of their respective owners.

Circle 47 on reader service card



## TRAPPING WITH GRADIENTS

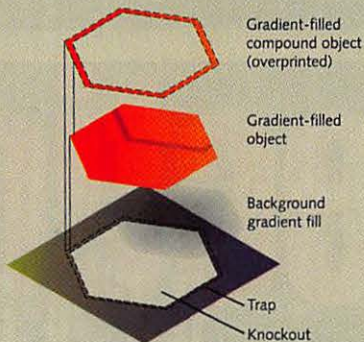
Although Adobe Illustrator 5.0's Paint Style dialog box doesn't allow you to paint a stroked path with a gradient for creating a trap, Evan Goldstein of Wantagh, New York, has devised an easy workaround. The following steps illustrate the method, with a hexagon that is filled with a red-to-yellow gradient on a rectangular background that is filled with a green-to-purple gradient. This method works with other objects (including type you have converted to outlines) and any combination of gradients.

1. Create a rectangle and fill it with a green-to-purple gradient. Then create a hexagon on top of it, fill it with a red-to-yellow gradient, and stroke it with a solid line for the trap (as always, the stroke should be twice the thickness of the trap).

2. Select the hexagon and choose Outline Stroked Path from the Objects submenu of the Filter menu. This filter removes the hexagon's original stroke and creates a new compound path that precisely outlines the hexagon's original stroke. You may find it helpful to enlarge the view so you can clearly see the new compound path. To understand what the filter created, use the selection tool in preview mode to drag the compound path out of position temporarily. Then undo to move the compound path back into position. This compound path will be the overprinting stroke for the hexagon.

3. Select the original hexagon and make sure it is not set to overprint. Then select the compound path, which can be filled as an object, and fill it with the same red-to-yellow gradient as the hexagon. Set the compound path's fill to overprint. Now the edges of the original hexagon are covered by a compound path that extends into the green-to-purple background and overprints to act as a spread.

In this example, the object is lighter than the background. If the background in your drawing is lighter than the object, fill the trap with the same gradient as the background. If you want to change the direction of the gradient, make sure to first select both the object and the compound path so that the trap's fill matches the object's fill. It's easier to select an individual object—the compound path, the object it traps, or the backdrop object—if you put them in separate layers. This is especially helpful if you want to use the gradient tool to change the angle of the gradient.



zontal dimension of the original image.

3. Copy the image from the original document and paste it into the square document.

4. Rotate the selection to a vertical orientation, copy it, and then use the Paste into New Picture command to create a new document with the image vertically oriented.

*John Allison*

*Vancouver, British Columbia, Canada*

## Theft Recovery Aid

**TIP** PowerBook owners, a custom start-up screen can help you recover your computer if it is ever stolen. Just create a PICT file containing the text "THIS POWERBOOK IS STOLEN! Please call police or owner: 310/555-1212" and save the file in your PowerBook's System Folder in start-up screen format. Better yet, include digitized photos and vital statistics of yourself and

other persons authorized to have the PowerBook (see "Authorized Carriers"). For even more security, use ResEdit or some other file-utility software to make the Startup Screen file invisible. Even a thief who knows where to look for a start-up graphic will conclude you burned it into ROM.

*Kevin McKeown*

*Santa Monica, California*

Many programs can save PICT files in start-up screen format, including Deneba's Canvas 3.0, Capture Viewer (bundled with Mainstay's Capture 4.0), Adobe Photoshop (all versions), and Deneba's Ultra-Paint 1.03.

Utility software such as Connectix PowerBook Utilities, Norton Essentials for PowerBook, and VST Systems' PBTools can be set to require entering a password before allowing your PowerBook to wake up or start up, but these passwords are easily bypassed by starting up with a floppy disk. Disk-locking software such as SafeLock (Trend Micro Devices,



This PowerBook May Be

## STOLEN!

Please call police or 310/555-1212 if anyone besides King Stone (owner, pictured at left) is in possession of this PowerBook.

**Authorized Carriers** A start-up screen like this won't keep someone from walking off with your momentarily unattended PowerBook, but just imagine the scene at the pawn shop.

310/782-8190, 800/228-5651) as well as the disk-locking options of many hard drive formatting programs prevent bypassing the password. For more information on PowerBook security, see *PowerBook Notes*, June 1993.—L.P.

## ZTerm Menu Separator

**TIP** You can create a separator line in ZTerm 0.9's Dial menu by creating a new entry in the dial directory with a hyphen as the name. This is useful for me since I access two sets of BBS numbers, each set in a different area code: one from my home town and one where I attend school. I make an entry appear above the separator line by prefixing its name with a space, and I do nothing special to entries I want to appear below the separator. ZTerm evidently alphabetizes its Dial menu by the numeric codes that the computer uses to internally represent text, and a space has a lower code than a dash, which has a lower code than numbers and the letters of the alphabet.

*Matt Brown*  
*Columbia, Missouri*

This tip is not mentioned in the ZTerm documentation, but is described in the ZTerm 0.9 FAQ by Leslie Jones. This document answers frequently asked questions (FAQs) about ZTerm and includes undocumented tips, ResEdit hacks, bug reports, and bugfixes. It is always available electronically on America Online and numerous Internet FTP sites, and it is usually available on other commercial online services as well.—L.P. **m**

We pay from \$25 to \$100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses.

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Guide to System 7.1, 2nd Edition* (IDG Books Worldwide, 1993).

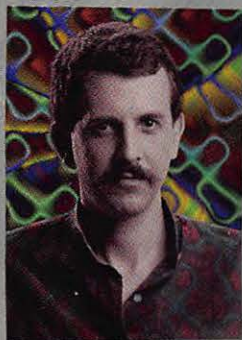


# Kai's Power Tools™ 2.0

## Divine the Future of Imaging



Thirty-three fantastic filters and extensions for Photoshop, Painter, Canvas, PixelPaint, PhotoFlash and others that accept plug-ins. Radiant gradients. Gorgeous textures. Awesome fractals. As the highest rated program ever reviewed in MacWeek, Kai's Power Tools is unmatched. And now it's a standalone solution because it includes Color-It!, Micro Frontier's award-winning 32-bit image processing paint program—FREE!



"KPT is not only great for dazzling special effects, but it provides a wealth of tools for the nuts and bolts work we all do every day."

Lee Varis  
Digital Artist

**ABOUT THE IMAGE.** Renowned digital artist/photographer Lee Varis of Los Angeles, Calif., filled in the world of "The Hermit", one in his series of haunting tarot card images, using Kai's Power Tools. KPT's Gradient Designer produced the glowing orb and its cascading rays, KPT Texture Explorer created the card's border, while the KPT Sharpen Intensity filter brought out details in the rock. To build the dream-like landscape on the horizon, Varis used a beta version of the awesome KPT New World Explorer™ (codename "Bryce"), a powerful natural and supernatural 3-D landscape creation program—coming soon from HSC Software.

MacWEEK



MacUser



Publish  
March 1994



Circle 5 on reader service card





PowerPC 620  
MOTOROLA



# WHERE IT ALL COMES INTO VIEW

## A WORLD OF OPPORTUNITY

HOW CAN YOU MAXIMIZE THE POTENTIAL OF THE MACINTOSH? SEE THE LATEST AND BEST MACINTOSH PRODUCTS AND SERVICES? LEARN HOW BEST TO PUT THE MACINTOSH TO WORK FOR YOU? DISCOVER ALL THIS AND MORE AT MACWORLD EXPO.

WITH OVER 400 EXHIBITING COMPANIES PRESENTING THE LATEST IN MACINTOSH TECHNOLOGY, MACWORLD EXPO IS THE SINGLE BEST RESOURCE FOR LEARNING HOW TO HARNESS THE POWER OF THE MACINTOSH. VISIT EXHIBITS FROM THE LEADING MACINTOSH VENDORS. MAKE PRACTICAL DECISIONS ON HOW TO CONFIGURE YOUR MACINTOSH SYSTEM TO MEET YOUR BUSINESS OR PERSONAL NEEDS. ENVISION TOMORROW'S TECHNOLOGY, UNDER DEVELOPMENT TODAY. AT MACWORLD EXPO, THE WORLD OF MACINTOSH ALL COMES INTO VIEW.



## DISCOVER THE CREATIVE POSSIBILITIES

AT MACWORLD EXPO, MAKE SIDE BY SIDE COMPARISONS OF THOUSANDS OF MACINTOSH HARDWARE, SOFTWARE, PERIPHERAL AND SERVICE PRODUCTS. HAVE A QUESTION? NEED AN EXPERT OPINION? OUR ON-SITE MACINTOSH PROFESSIONALS LEND THEIR EXPERTISE TO HELP YOU CHOOSE THE BEST PRODUCTS FOR YOUR INDIVIDUAL NEEDS. WE'LL HELP YOU TAKE YOUR MACINTOSH TO THE MAX!

## MACWORLD Expo/Boston; August 2-5, 1994

MACWORLD Expo/Boston will cover over 350,000 square feet of exhibit space at both the World Trade Center and Bayside Exposition Center. When you come to MacWorld Expo/Boston, you'll see uses and applications for the Macintosh in a variety of areas including: Networking, Spreadsheet Analysis, Databases, Education, Research, Word Processing, Accounting, Law, CAD/CAM, Forecasting, Design, Publishing, Illustration, Animation, Music, Programming, Entertainment and Multimedia. You'll see all this spread out over both locations so plan to be in Boston from August 2-5 and experience the Macintosh at its absolute best!

### DON'T MISS THE UGWUMP!

USER GROUP  
WELCOMING  
UNWINDING  
MEETING PLACE

"PEOPLE  
NETWORKING  
PARLOR" FOR USER  
GROUPS TO SHARE  
SUCCESS STORIES,  
EXCHANGE  
NEWSLETTERS  
AND LITERATURE.  
LEARN HOW TO  
START A USER  
GROUP IN  
YOUR AREA!

## PRE-REGISTRATION SAVINGS!

NOW IS THE TIME TO PRE-REGISTER FOR MACWORLD EXPO. RETURN THE ATTACHED PRE-REGISTRATION FORM WITH YOUR PAYMENT BY JUNE 24 AND SAVE \$30 ON ALL CONFERENCE SESSIONS AND EXHIBITS (\$120 NOW VS. \$150 AT THE DOOR). AN EXHIBITS-ONLY ADMISSION SAVES YOU \$15 (\$25 NOW VS. \$40 CASH ONLY AT THE DOOR). AND SINCE YOUR TIME IS AS VALUABLE AS YOUR MONEY, WE'LL SEND YOUR ADMISSION BADGE EARLY WHEN YOU PRE-REGISTER. AVOID THE REGISTRATION CROWDS AND GET A JUMP START ON THE EXHIBITION!



# THE CONFERENCE PROGRAM

## Tomorrow's Innovations Today

**MACWORLD EXPO/BOSTON 1994 CELEBRATES THE 10TH ANNIVERSARY OF THE MAC'S DEBUT WITH A PANORAMA OF EMPOWERING OPPORTUNITIES AND POSSIBILITIES. FROM APPLE'S TECHNOLOGICAL BREAKTHROUGHS TO THE IMPACT OF DIGITAL CONVERGENCE, YOU'LL DISCOVER NEW DIMENSIONS TO THE MAC.**

**HERE'S A PREVIEW OF MACWORLD EXPO/BOSTON'S 14 SEPARATE CONFERENCE PROGRAMS. CREATE YOUR OWN AGENDA:**

### 1 The PowerPC Conference.

EVERYTHING THERE IS TO KNOW ABOUT POWERPC — FOR USERS, VENDORS, AND DEVELOPERS — INCLUDING: WHAT POWERPC DELIVERS; APPLE'S IMPLEMENTATION VS. IBM'S; COMPATIBILITY; UPGRADING; WHEN/WHAT TO BUY; NATIVE VS. EMULATION; HOW COMPETITIVE IS POWER PC?; POWERPC DEVELOPMENT TOOLS; AND MORE.

### 2 The Design Conference.

CELEBRATED MAC DESIGNERS SHARE CREATIVE INSIGHTS AND POWER-USER TIPS ON: COLOR MANAGEMENT; CREATIVE IMAGING; PREPRESS; DIGITAL PHOTOGRAPHY; MIXING MEDIA; DIGITAL ART; KPT; AND MORE.

### 3 The Entertainment Conference.

THE BEST IN THE BUSINESS PRESENT TOOLS AND TECHNIQUES FOR TV, FILMS, AND COMMERCIAL APPLICATIONS, FEATURING: INTERACTIVE CINEMA; QUICKTIME MOVIES; DIGITAL VIDEO; HIGH-END MUSIC; INNOVATIVE EFFECTS; INTERACTIVE EROTICA; LIVE THEATRE; AND BROADCAST QUALITY GRAPHICS.

### 4 The Connectivity Conference.

ENHANCE COMMUNICATIONS, MAXIMIZE NETWORKS, AND SEE WHAT'S IN STORE FOR THE FUTURE WITH: CONNECT-ANYWHERE NETWORKING; MAXIMIZING THE INTERNET; NETWORKING NEWTONS; TCP/IP; CLIENT/SERVER; NETWORK MANAGEMENT TOOLS; APPLE TALK NETWORKING.

### 5 The Small Office/Home Office Conference.

YOUR NEEDS ARE DIFFERENT THAN GIANT ORGANIZATIONS! SPECIAL SOHO TIPS ON MARKETING, TELECOMMUTING, FINANCE/ADMINISTRATION.

### 6 The Science/Technology Conference.

THE MAC AS A CRITICAL TOOL IN LABORATORY AND SCIENTIFIC SETTINGS, INCLUDING TIPS ON VISUALIZATION USING QUICKTIME, SCIENTIFIC DATA ANALYSIS, AND VIRTUAL REALITY.

### 7 The Programmer/Developer Conference.

FOR IN-HOUSE DEVELOPERS, VETERAN INDEPENDENTS, AND NOVICE MAC TECHIES ALIKE: THE NEW WORLD OF OPPORTUNITIES WITH NEWTON, POWERPC, OPENDOC, APPLESCRIPT — PLUS ULTIMATE MAC PROGRAMMING TIPS.

### 8 The Education Conference.

TEACHERS AT THE ELEMENTARY, SECONDARY, AND UNIVERSITY LEVELS SHARE SUCCESSFUL MAC EXPERIENCES WITH MULTIMEDIA, CD-ROM, HYPERCARD, QUICKTIME, BBSs, INTERNET — AND STUDENTS DEMO THEIR MOST OUTSTANDING MAC PROJECTS IN SCIENCE, MATH, SOCIAL STUDIES AND DESKTOP PUBLISHING.

### 9 The How-to-Get-Started Conference.

LEARN THE BASICS — OF NEWTON, DESKTOP PUBLISHING, MUSIC, INTERNET, TELECOMMUNICATIONS, DESIGN, MULTIMEDIA, QUICKTIME, AUTHORIZING, INTERACTIVITY, AND USING CD-ROM.

### 10 The Advanced User Conference.

VETERAN USERS SHARE THEIR EXPERTISE ON CUSTOMIZING YOUR MAC, RESOLVING SYSTEM CONFLICTS, MAXIMIZING FONTS, AND POWERIZING YOUR POWERBOOK.

### 11 The Special Interest Group Conference.

LOOKING TO COMPARE MAC NOTES WITH OTHERS? DEVELOP AN INVALUABLE "USER NETWORK." HERE YOU'LL FIND SESSIONS ON THE MAC IN THE LAW OFFICE, HEALTH CARE, REAL ESTATE, AND IS; AND THE PERENNIAL FAVORITE MUSE (MACWORLD EXPO USER GROUP EXTRAVAGANZA).

### 12 Application Workshops.

INTENSIVE TRAINING SESSIONS BY MACACADEMY ON: BEGINNING MACINTOSH; ADVANCED MACINTOSH; MACINTOSH FONTS; BEGINNING MAC NETWORKING; CLARIS FILEMAKER PRO; MICROSOFT WORD; ALDUS Pagemaker; MICROSOFT EXCEL.

### 13 The Multimedia Conference.

CREATE QUALITY PRODUCTIONS AND PRESENTATIONS WITH BOTH HIGH-END AND LOW-END MULTIMEDIA TOOLS. SHARE INSIGHTS FROM THE WORLD'S MOST SUCCESSFUL MULTIMEDIA EXPERTS ON INTERACTIVITY, DESKTOP VIDEO, ANIMATION, INTERFACE DESIGN, AUTHORIZING TOOLS — AND SEE THE PROFITABLE IMPACT IN EDUCATION, TRAINING, AND MUSEUMS.

### 14 The CD-ROM Conference.

WANT TO PUBLISH AN ENTERTAINMENT OR CONSUMER CD? START WITH THE MAC. LEARN ABOUT PHOTO CD; KIOSKS; BUILDING SUCCESSFUL TITLES; DEVELOPING INTERACTIVE GAMES; CONTENT LICENSING; DOCUMENT CONVERSION AND MANAGEMENT; AND MARKETING YOUR CD.

## MACWORLD EXPO/BOSTON

BAYSIDE EXPOSITION CENTER  
& WORLD TRADE CENTER

#### EXHIBITION HOURS

AUGUST 2-4 10:00AM-6:00PM  
AUGUST 5 10:00AM-4:00PM

#### CONFERENCE HOURS

AUGUST 2 10:30AM-5:30PM  
AUGUST 3-4 11:30AM-5:30PM  
AUGUST 5 11:30AM-2:30PM



# REGISTRATION FORM

## PRE-REGISTER FOR MACWORLD EXPO/BOSTON BY JUNE 24, AND SAVE \$15 TO \$30

PLEASE REGISTER ME FOR:

☐ **PACKAGE ONE \$120.**

CONFERENCE SESSIONS\* AND EXHIBITS.  
PREREGISTER BY JUNE 24  
(\$150 AT THE DOOR).

☐ **PACKAGE TWO \$25.**

ADMISSION TO EXHIBITS ONLY. PRE-REGISTER  
BY JUNE 24 (\$40 CASH ONLY AT THE DOOR).

☐ **CHECK IF APPLICABLE.**

I'M AN INTERNATIONAL ATTENDEE. PLEASE  
SHIP MY BADGE BY FEDERAL EXPRESS.  
ENCLOSED IS AN ADDITIONAL \$45.

PLEASE CHOOSE YOUR PACKAGE AND FILL OUT THE FORM COMPLETELY.  
INCOMPLETE FORMS WILL BE RETURNED. ONE FORM PER PERSON; MAKE  
PHOTOCOPIES FOR ADDITIONAL PEOPLE. PLEASE DO NOT STAPLE CHECK  
TO FORM. REGISTRATION FORMS RECEIVED AFTER JUNE 24, WILL BE  
RETURNED UNPROCESSED. PURCHASE ORDERS CANNOT BE ACCEPTED. ALL  
REGISTRATION FEES ARE NONREFUNDABLE. A \$20 FEE WILL BE CHARGED  
FOR ALL RETURNED CHECKS. SEND COMPLETED FORMS TO:

MACWORLD EXPO/BOSTON  
P.O. BOX 4010  
DEDHAM, MA 02027

U.S. BADGES: MAILED AROUND JULY 18.

INTERNATIONAL BADGES: HELD ON-SITE.

BADGE PICKUP HOURS ARE:

AUG. 1, 11AM - 3PM; AUG. 2-4, 9AM - 6PM; AUG. 5, 9AM-4PM

**PLEASE SEND MY REGISTRATION BADGE AND FURTHER INFORMATION TO:**

PLEASE CHECK ONE: ☐ HOME ADDRESS ☐ COMPANY ADDRESS

FIRST NAME \_\_\_\_\_ MIDDLE INITIAL \_\_\_\_\_ LAST NAME \_\_\_\_\_

STREET ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

COUNTRY (OTHER THAN U.S.) \_\_\_\_\_ TELEPHONE \_\_\_\_\_

IF MAILING TO COMPANY ADDRESS: (IF MAILING TO YOUR HOME ADDRESS, LEAVE THE NEXT TWO LINES BLANK).

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

☐ CHECK ENCLOSED (MAKE PAYABLE TO MACWORLD EXPOSITION) AMOUNT \$ \_\_\_\_\_

☐ MASTER CARD ☐ VISA ☐ AMERICAN EXPRESS AMOUNT \$ \_\_\_\_\_

ACCOUNT NUMBER \_\_\_\_\_

EXPIRATION DATE (INCLUDE ALL NUMBERS) \_\_\_\_/\_\_\_\_/\_\_\_\_

CARD HOLDER SIGNATURE (SIGNATURE NECESSARY TO BE VALID) \_\_\_\_\_

IF CARD HOLDER IS OTHER THAN REGISTRANT, PLEASE PRINT CARD HOLDER'S NAME BELOW:

FIRST NAME \_\_\_\_\_ MIDDLE INITIAL \_\_\_\_\_ LAST NAME \_\_\_\_\_

CASH ONLY AT THE DOOR. AFTER JUNE 24, YOU MUST REGISTER AT THE SHOW.

**PLEASE CHECK THE APPROPRIATE INFORMATION:**

**YOUR INDUSTRY  
OR PROFESSION**

(CHOOSE ONLY ONE)

1. ☐ ACCOUNTING/FINANCE
2. ☐ ARCHITECTURE/CONSTRUCTION
3. ☐ ART/DESIGN/CREATIVE SERVICES
4. ☐ ARTS & ENTERTAINMENT
5. ☐ COMMUNICATIONS/PRINTING/PUBLISHING
6. ☐ COMPUTER RESELLER/VAR/VAD
7. ☐ CONSULTING
8. ☐ CORPORATE/GENERAL MANAGEMENT
9. ☐ DISTRIBUTOR/DEALER/RETAILER/SERVICE
10. ☐ ENGINEERING/R&D
11. ☐ GOVERNMENT/MILITARY
12. ☐ HEALTH/MEDICAL SERVICES
13. ☐ COLLEGE/UNIVERSITY
14. ☐ ELEMENTARY/HIGH SCHOOL
15. ☐ LEGAL SERVICES
16. ☐ MANUFACTURER (COMPUTER INDUSTRY)
17. ☐ MANUFACTURER (NON-COMPUTER INDUSTRY)

18. ☐ MARKETING/SALES/PR/COMMUNICATIONS
19. ☐ OTHER
20. ☐ DOES NOT APPLY

**YOUR TITLE**

(CHOOSE ONLY ONE)

21. ☐ CEO/PRESIDENT/VP
22. ☐ CONTROLLER/TREASURER/ACCOUNTANT
23. ☐ DP/MIS MANAGER
24. ☐ NETWORK MANAGER
25. ☐ PROGRAMMER/ANALYST
26. ☐ ENGINEER/SCIENTIST/R&D
27. ☐ MANAGER/DEPARTMENT HEAD
28. ☐ PROFESSIONAL (LAWYER, DOCTOR, ETC.)
29. ☐ CONSULTANT
30. ☐ MARKETING/SALES
31. ☐ EDUCATOR
32. ☐ ART DIRECTOR/GRAPHICS
33. ☐ EDITOR/WRITER
34. ☐ STUDENT
35. ☐ OTHER
36. ☐ DOES NOT APPLY

**SIZE OF YOUR ORGANIZATION**

(NUMBER OF EMPLOYEES NATIONAL & INTERNATIONAL) CHOOSE ONLY ONE

37. ☐ UNDER 50
38. ☐ 50 - 99
39. ☐ 100 - 499
40. ☐ 500 - 999
41. ☐ 1,000 & OVER
42. ☐ DOES NOT APPLY

**WHICH PERSONAL COMPUTER(S)  
DO YOU OWN/USE?**

(CHOOSE ALL THAT APPLY)

43. ☐ MACINTOSH PLUS/SE/SE30
44. ☐ MACINTOSH CLASSIC SERIES/LC SERIES
45. ☐ MACINTOSH POWERBOOK SERIES/DUO SERIES
46. ☐ MACINTOSH II SERIES
47. ☐ MACINTOSH PERFORMA SERIES
48. ☐ MACINTOSH CENTRIS SERIES
49. ☐ MACINTOSH QUADRA SERIES
50. ☐ MACINTOSH WORKGROUP SERIES
51. ☐ IBM PC OR COMPATIBLE
52. ☐ OTHER
53. ☐ NONE

**DO YOU RECOMMEND,  
BUY, OR APPROVE  
MICROCOMPUTER SOFTWARE  
AND/OR PERIPHERALS?**

54. ☐ YES
55. ☐ NO

**IF YES, PLEASE INDICATE  
FOR HOW MANY MACINTOSH  
COMPUTERS YOU HAVE THIS  
INVOLVEMENT.**

56. ☐ 1 - 10
57. ☐ 11 - 25
58. ☐ 26 - 50
59. ☐ 51 - 100
60. ☐ 101 - 500
61. ☐ 501 +

\*MACWORLD EXPO CONFERENCE SESSIONS ARE ON A FIRST-COME, FIRST-SERVED BASIS WITH NO GUARANTEED SEATING AND ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL REGISTRATION FEES ARE NON-REFUNDABLE. DO NOT STAPLE CHECK OR MONEY ORDER TO: MACWORLD EXPO, P.O. BOX 4010, DEDHAM, MA 02027. FOR OVERNIGHT PACKAGES SHIP TO: 260 MILTON STREET, DEDHAM, MA 02026.



# ATTENDING MADE EASY

MACWORLD Expo/Boston 1994, BAYSIDE EXPOSITION CENTER, 200 MOUNT VERNON STREET  
AND WORLD TRADE CENTER, 164 NORTHERN AVENUE.

TUESDAY, AUGUST 2 - THURSDAY, AUGUST 4, 10:00 A.M. - 6:00 P.M. AND FRIDAY, AUGUST 5, 10:00 A.M. - 4:00 P.M.

## U.S. Attendees.

BADGES WILL BE MAILED ON OR ABOUT JULY 18. BE SURE TO CHECK BOX INDICATING WHERE BADGE SHOULD BE SENT.

## International Attendees.

INTERNATIONAL BADGES (INCLUDING CANADIAN) WILL BE HELD FOR PICK-UP AT THE INTERNATIONAL PREREGISTRATION COUNTER AT BAYSIDE EXPO CENTER. FOR FEDERAL EXPRESS SERVICE, CHECK THE APPROPRIATE BOX BELOW AND ADD \$45 TO YOUR PREREGISTRATION FEE. FILL IN YOUR EXACT STREET ADDRESS (NO P.O. BOXES) AND INCLUDE YOUR TELEPHONE NUMBER AND COUNTRY CODE. WE WILL FEDERAL EXPRESS YOUR BADGE DIRECTLY TO YOU. BADGE PICKUP HOURS ARE: AUG. 1, 11AM - 3PM; AUG. 2-4, 9AM - 6PM; AUG. 5, 9AM-4PM

## Fly American Airlines and Save.

ENJOY SAVINGS ON APPLICABLE FARES WHEN YOU FLY AMERICAN AIRLINES, THE OFFICIAL AIRLINE OF MACWORLD EXPO. AMERICAN IS OFFERING ATTENDEES DISCOUNTS OF 5-10% ON MOST FARES. DIAL 800-433-1790 TO SPEAK WITH AN AMERICAN AIRLINES RESERVATIONIST AND REFERENCE STAR FILE #S017AL. SAVINGS ARE AVAILABLE ON APPLICABLE FARES ONLY.

## Car Rental Discounts From Alamo.

ALAMO RENT A CAR HAS BEEN APPOINTED THE OFFICIAL CAR RENTAL COMPANY FOR MACWORLD EXPO/BOSTON, AND SPECIAL DISCOUNTED RATES HAVE

BEEN EXTENDED TO ATTEN-

DEES. THESE RATES

ARE AVAILABLE ONE

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AFTER THE MEET-

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# Networks

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## Global Village Introduces Fax and ARA Servers

**G**LOBAL VILLAGE COMMUNICATION, the maker of popular modems for the Macintosh, has taken the plunge into network hardware with its new OneWorld line of servers. The first two products, due to ship April 4, are the look-alike OneWorld Remote Access ARA server and the OneWorld Fax server.

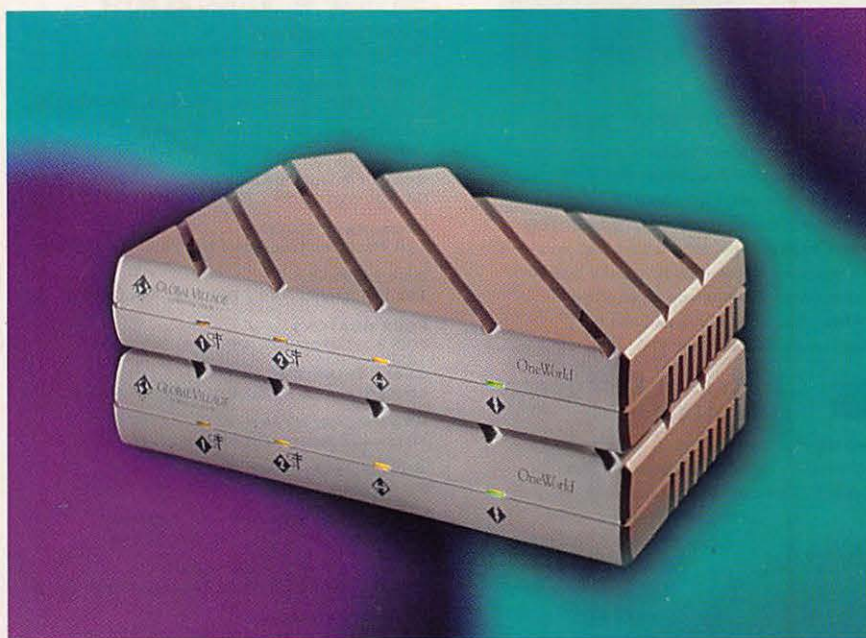
The OneWorld Remote Access ships with either one or two internal V.32terbo (19.2-Kbps) PowerPort Mercury modems and 1MB of RAM, with room for up to 9MB of RAM using 32-pin SIMMs. It can connect to either a LocalTalk or a 10BaseT network. The server supports Apple Remote Access (ARA) 2.0, taking advantage of the security enhancements provided for by Apple, but ARA 1.0 clients can also dial in.

The OneWorld Remote Access will cost \$1199 for LocalTalk and one modem, \$1899 for Ethernet and two modems. The ARA client software must be purchased from Apple. The OneWorld Fax ships with one or two PowerPort Bronze 9600-bps fax modems.

The fax server sets up quickly and supports queuing and priority faxing. The GlobalFax for OneWorld software, which closely resembles the fax software bundled with the company's modems, graphically displays the fax queue and can play digitized audio of the call in progress. The software can also arbitrate between the fax server and an internal or external Global Village modem, so there's no need to open the Chooser each time you connect to or disconnect from the network.

The OneWorld Fax will list for \$999 with LocalTalk and one modem. The two-modem Ethernet model will list for \$1499. Both will include a license for 30 clients. Ten more users will cost \$249; 50 more, \$999. A site license will cost \$3999.

Global Village's OneWorld Manager software manages all linked OneWorld



Global Village Communication's OneWorld Fax and OneWorld Remote Access servers appear to be identical, but they contain different modems.

servers. The administrator stores user and group information on individual servers in their flash ROM; OneWorld Manager downloads the information and uploads any changes the administrator makes. OneWorld Manager also displays current server activity in a window and maintains a running record based on logs kept by the individual servers. OneWorld Manager issues each user a "passport," which controls the user's access to all OneWorld servers on the network. The software can also import and export AppleShare and Shiva Net Manager users and groups.

Global Village has already announced upgrade plans for the new servers. These plans include adding dial-out capability to the OneWorld Remote Access by the end of this year, adding four- and eight-port models, and taking both products cross-

platform. Global Village, 415/390-8200, 800/736-4821.—CAMERON CROTTY

## Restarting Macs by Phone

**F**RUSTRATED BY TRYING TO DIAL into a crashed or shut-down Apple Remote Access server Mac? Mac Power On/Off + Aux (\$199.95), from Server Technology, is designed to solve both problems.

Made up of two compact hardware devices and a system extension, the package can activate a Mac when remote users dial into it, shut it down after they log off, and remotely restart a crashed Mac.



The cigarette-pack-size Intelligent Power Module (IPM) acts as an intermediary between the wall outlet and the Mac. The IPM connects with phone wire to the Mac Power On/Off unit, which also connects to the Mac's modem using standard RJ-15 telephone jacks.

If the Mac is turned off when a remote user dials in, the Mac Power On/Off unit detects the ring of the incoming call and signals the IPM to turn on the juice and then power up the Mac, booting it up (the communications program on the awaiting Mac must also be set to start up automatically). A system extension monitors the serial port and issues a shutdown command after a specified period of inactivity. The IPM shuts off the power a few minutes later, which turns off compact Macs that don't power down from the shutdown command.

To reboot a crashed Mac, you call in once to turn it off, and again to restart it.

For computers that share a phone line, Mac On/Off + Aux offers a second, pass-through RJ-15 telephone port to which you can connect a telephone, an answering machine, or a fax machine. Server Technology, 408/745-0300, 800/835-1515.—MARGIE WYLIE

## Comm Toolbox Helper

**T**HANKS TO THE EFFORTS OF THE small Russian software developer Stalker Software, Apple's Communication ToolBox (CTB) can finally work as advertised. With Stalker's PortConnector for Macintosh control panel (\$49), any application that can use a modem can now use System 7's CTB Connection Tools to run protocols such as TCP/IP, X.25, and even ISDN.

The CTB in System 7 was supposed to make it possible for any communications program to use any connection method. Developers would write their software to work with CTB, other developers would write drop-in Connection Tools that supported different protocols, and all applications could communicate any way they pleased. It didn't work that way. Many applications (including Apple Remote Access) still don't support the Connection Tools capability.

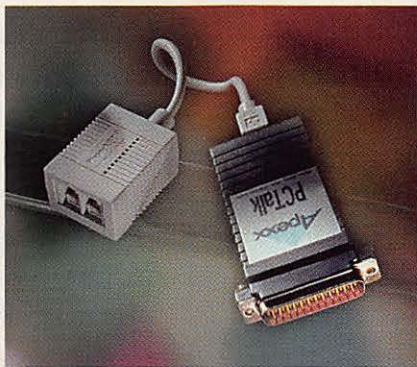
The PortConnector enables any communications program—such as ARA, terminal emulators, and electronic bulletin board systems—to connect using any method for which you have a CTB Connection Tool. Third parties are currently shipping Connection Tools for ISDN,

TCP/IP, and X.25. PortConnector works by creating virtual serial ports that accept data and respond to the programs as a modem would. Behind the scenes, the software translates commands and sends data through a CTB Connection Tool. For example, if you have the correct CTB Connection Tool and a copy of PortConnector running on both client and server machines, you could run ARA over TCP/IP, X.25, or ISDN, and the program would never know the difference.

PortConnector can also help CTB-compliant applications nest one connection method within another—for example, using one Connection Tool to reach a terminal server and another to control the modem as though it were connected locally. Stalker Software, 415/927-1026, 800/262-4722.—MARGIE WYLIE

## Portable LocalTalk for PCs

**M**OST LOCALTALK ADAPTERS FOR Windows and DOS PCs require you to open the PC's case and install the card in a free expansion slot, which some PCs either can't spare or, in the case of portables, don't have. Apexx Technology's handy external adapter lets you install LocalTalk in even portable PCs without cracking a case. About the size of a pack of playing cards, Apexx's PCTalk adapter (\$199) snaps into a PC's parallel port. The adapter requires more power than the



Apexx Technology's portable PCTalk adapter makes it easy to add LocalTalk connectivity to a PC.

parallel port offers, however. The adapter can draw this power either through the PC's keyboard port, using its own pass-through plug, or via a standard 5V AC adapter plugged into a wall outlet.

PCTalk comes bundled with Farallon Computing's PhoneNet PC software, which provides the AppleTalk protocols and client software that let PC users log on to AppleShare servers through a

## IN BRIEF

### ■ Ethernet Prices Plummet

Apple, Sonic Systems, and Dayna Communications have slashed Ethernet adapter prices. Apple (408/996-1010) is now selling its first card that costs less than \$100, the Apple Ethernet LC Twisted-Pair card (\$99), which connects Mac LCs to 10BaseT networks. Sonic Systems (408/736-1900) cut Ethernet prices across its entire line by as much as 61 percent, reducing half its adapters to retail prices under \$100, with no adapter priced over \$150. Dayna (801/269-7200) cut its line by up to 40 percent with less drastic results: its cheapest adapter is now priced at \$129, with prices for its innovative external adapters still ranging up to \$379.

### ■ Management Update

Sonic Systems recently updated two programs: Radar 4.0 (\$499), network-monitoring software, sports a new scripting system, among other improvements. Server Sentry 2.0 (\$499), AppleShare-server remote-control software, lets you add new users and groups on the fly and cleans up some bugs that caused previous versions to crash. Updates to previous versions of either product are available for \$99. 408/736-1900.

Chooser-like interface. Apexx's optional PCTalk Timbuktu package (\$399) includes Farallon Computing's Timbuktu for Windows PhoneNet Kit, through which a PC user running Windows can remotely control any Mac that is on the network and equipped with its own copy of Timbuktu. Apexx, 208/336-9400, 800/767-4858.—MARGIE WYLIE

## Virus Hunting

**W**ITH TECHWORKS' GRACELAN Network Manager 3.1 (\$795) and Datawatch's Virex 5.1 (\$99.95), administrators can run virus scans, receive scan reports, and perform virus repairs on all Macs on an AppleTalk network, without interrupting service to users. TechWorks supplies the upgrade free to 3.0 owners; 2.0 users pay \$199. TechWorks, 512/794-8533, 800/680-6847; Datawatch, 919/549-0711.—MARTHA STRIZICH



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**Circle 161 on reader service card**





BY CARY LU

# PowerBook

## Notes

### Managing SCSI Devices

THE HARD DRIVE AND THE SCSI PORT ON a PowerBook behave pretty much like the equivalent features on a desktop Mac, but they aren't entirely the same.

#### Using Multiple System Folders

When you set up a PowerBook's hard drive, you can choose one of two completely different strategies. One is to install all the trappings of a typical desktop Mac's hard disk. The other is to install a lean, mean system; see *PowerBook Notes*, February 1993. In fact, you probably want both—one for the office, the other for the road. Or you may need to switch to a foreign-language system. You can switch between a rich and a lean System Folder with an extension-manager program that lets you change the active control panels and extensions at start-up.

There are two ways to install multiple System Folders. One is to simply put them all on the hard drive. Many people warn against this, but all Mac operating systems beginning with System 6 can handle multiple System Folders. However, one essential trick is required—you must choose, or "bless," the specific System Folder you want to use with System Picker, a free program by Kevin Aitken available from online services and bulletin boards (Blesser, an older program for the same function, apparently has not been updated since 1987). To change System Folders, use System Picker to bless another folder and then restart. You should give each System Folder a distinctive name, and you must keep track of which System Folder you are working with or modifying at any given time.

I prefer the second method: divide the hard drive into multiple partitions and install a different system in each one. The



disadvantage is that each partition takes up a fixed amount of storage space; since you need to provide some extra space in each partition for possible changes to the System Folder, you might run out of storage space a little more quickly.

Apple HD SC can set up multiple partitions on a hard drive, but only one of those partitions can start up the PowerBook. To set multiple start-up partitions, try Drive7 (\$79.95 from Casa Blanca Works, 415/461-2227) or Hard Disk Toolkit, Personal Edition (\$79 from FWB, 415/474-8055). Drive7 can change the start-up partition more easily than Hard Disk Toolkit. You can't change the start-up partition with Apple's Startup Disk control panel, because it selects only the SCSI address, which is the same for all partitions on the drive.

Two start-up partitions offer some additional advantages. If you need to install system modifications or need to test a partition, you can start up from the

other partition. Another plus is the ability to compress one partition.

What are the optimum partition sizes? There's no simple answer. A small partition can hold an alternate System Folder and a disk utility for emergencies, leaving a large partition for everything else. But if you plan to use compression on a partition, it should be big enough to make compression worthwhile.

#### SCSI Cabling Conundrums

Other ways to use multiple systems involve connecting the PowerBook to an external hard disk drive or to another Macintosh. One start-up partition can manage the PowerBook alone; a second can manage the resources on the external hard disk or the other Macintosh.

A PowerBook's SCSI port is more complicated than a desktop Mac's: it has a different connector, operates in two distinct modes, and often requires two terminators rather than one (see "Connecting Cables"). For an all-in-one PowerBook, you should have two terminators rather than one when connecting an external SCSI device; for details, see the PowerBook manual. By contrast, the Duo's SCSI port behaves like a desktop Mac's, using a single terminator. Some SCSI devices come with internal termination. If you connect any PowerBook to a Mac IIx, use the IIx's special black terminator.

Depending on the SCSI device, you may need either a C-50 terminator or a DB-25 terminator. If you use an HDI-30/DB-25 adapter in SCSI disk mode, vendors such as APS Technologies say that no terminator is necessary to connect to most Macs, despite Apple's recommendation.



# CONNECTING CABLES

All SCSI ports built into PowerBooks use a squarish HDI-30 connector, unlike the DB-25 female plug of the desktop Macs. (A few third-party docks for Duos come with a DB-25 connector.) Most SCSI peripherals—such as hard disk drives and scanners—have female 50-pin connectors, although some use DB-25 connectors.

The PowerBook functions in one of two SCSI modes, depending on which type of cable is used.

- In SCSI standard mode, the PowerBook typically connects to SCSI devices with a 29-pin HDI-30 cable ending in a male C-50 connector.
- In SCSI disk mode, the PowerBook typically connects to another Mac with a 30-pin HDI-30 cable ending in a female C-50

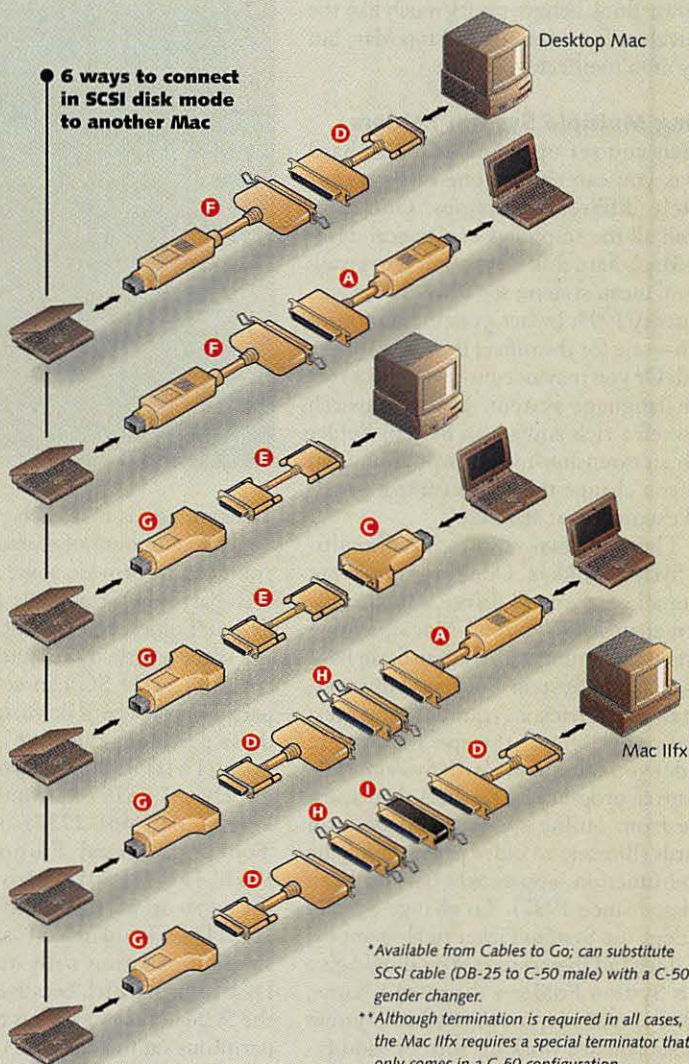
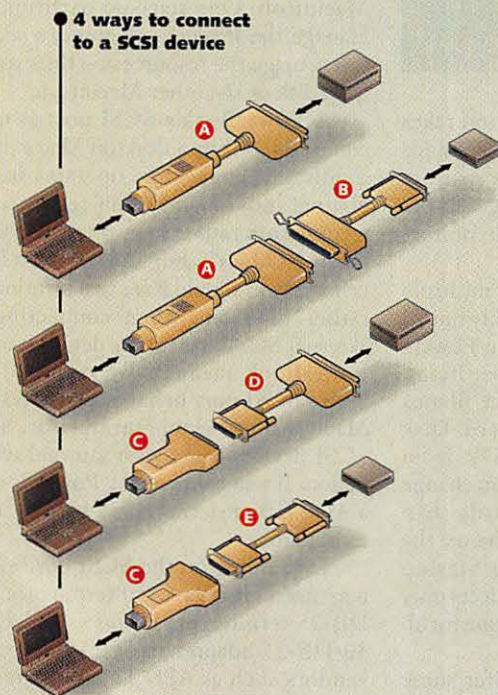
connector, which mates to a standard male C-50 cable ending in a male DB-25 connector that plugs into the other Mac. The PowerBook functions as an external hard drive for the other Mac. When in SCSI disk mode, the PowerBook should not be closed or it will overheat.

If you already have a lot of SCSI cables, the simplest way to connect everything to a PowerBook is to get an HDI-30-to-female-DB-25 adapter, which costs between \$30 and \$50. These adapters come in two main styles; some turn the DB-25 connector vertically, so you can easily insert and remove the adjacent plugs (ADB and telephone cord for the modem). The more conventional horizontal adapters from APS Technologies (816/483-6100, 800/874-1428) work

fine but can interfere with the adjacent plugs; that kind of adapter won't work on a PowerBook 100 with a floppy drive. Some versions of both the vertical and APS adapters support (through a built-in switch) both SCSI standard mode (29-pin) and SCSI disk mode (30-pin). The SCSI-disk-mode setting creates a potential termination problem, however (see the main text). In the diagrams, SCSI terminators (except in the special case of the IIfx) are omitted for simplicity, and because all-in-one PowerBooks require two terminators while Duos require only one.

If you haven't already invested in cables, you're better off getting one of the HDI-30-to-C-50 cables; they're more compact and simpler to use, but they don't come with a mode switch.

- A SCSI system cable (29-pin), HDI-30 to C-50 male
- B C-50 to DB-25 SCSI system cable\*
- C Adapter, HDI-30 to DB-25 female (29-pin SCSI mode)
- D SCSI cable, DB-25 male to C-50 male
- E DB-25 serial port cable (all pins wired straight through)
- F SCSI disk mode cable (30-pin), HDI-30 to C-50 female
- G Adapter, HDI-30 to DB-25 female (30-pin SCSI disk mode)
- H C-50 gender changer
- I Mac IIfx terminator\*\*



\*Available from Cables to Go; can substitute SCSI cable (DB-25 to C-50 male) with a C-50 gender changer.

\*\*Although termination is required in all cases, the Mac IIfx requires a special terminator that only comes in a C-50 configuration.



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mendation. For a IIfx, the only way to get the cables to match and include a IIfx terminator is by adding a C-50 gender changer or another SCSI device with two C-50 connectors. I've never seen a IIfx terminator in a DB-25 form. For C-50 gender changers, try Interex Computer Products (316/524-4747) or Cables to Go (513/224-8646, 800/826-7904), which also sells SCSI cables with reversed-sex connectors.

Before connecting a SCSI cable in either standard or disk mode, you must make sure the PowerBook is shut down, not merely asleep. This includes the Duo Dock and Duo MiniDock. (However, a floppy drive, mouse, and external keyboard may be safely attached via a dock to a *sleeping* Duo.) Also be sure to turn on any attached SCSI devices before you turn on the PowerBook; when you are done, shut down the PowerBook first and then turn off the SCSI devices.

### Using SCSI Disk Mode

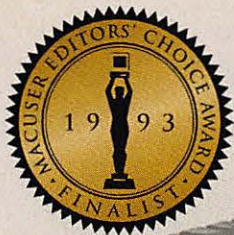
To support SCSI disk mode, the SCSI interface in PowerBooks differs from that of desktop Macs. SCSI disk mode reassigns a PowerBook's internal SCSI hard drive address a number between 1 and 6 (0 and 7 are taken by the other Mac and its internal hard drive), set in the PowerBook or PowerBook Setup control panel. You must also make sure that the hard disks on the PowerBook and the other Mac have different names and that no two devices in the SCSI chain have the same SCSI address.

For SCSI disk mode, follow the instructions in the PowerBook manual. Shut down both Macs before connecting or disconnecting—or you risk losing data. Do not unmount a PowerBook's SCSI icon by dragging it to the Trash; you may damage the directories of all mounted drives. Don't use a terminator when connecting to another PowerBook. If a PowerBook has a SCSI-disk-mode cable attached but not connected to another device, it won't start up normally.

The PowerBook 140, 145, 145B, and 170 lack the necessary ROM code for SCSI disk mode. However, the \$249 Laptop Liberator from Software Architects (206/487-0122) supplies a combination hardware SCSI adapter and software that supports SCSI disk mode on those models. Laptop Liberator can also create and format a DOS partition on a PowerBook hard disk so any PowerBook can connect as a SCSI drive to a DOS or Windows machine with a SCSI interface. **m**

CARY LU is a Macworld contributing editor who covers mobile- and remote-computing issues in this monthly column.



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# Multigrain Serials

*What to do when one modem port just isn't enough*

IMAGINE THAT YOU WERE BORN with only one nostril. Imagine wearing sneakers with lace-holes on only one side. Imagine that you just purchased a \$30,000 mini-van—and it seats *one*.

That's essentially the situation with your Macintosh. It has only one modem port. Into this single jack you're supposed to plug not only your modem, but also your music equipment (MIDI synthesizers), your MacRecorder microphone, your Wacom drawing tablet, your miniature label printer, your Sharp Wizard, perhaps your StyleWriter printer, and all manner of other Macintosh gadgetry. Can you say *hopeless*?

For thousands of Macophiles, the act of plugging and unplugging equipment from that solitary port and communing with the dust bunnies behind the computer is an unpleasant daily ritual. It's not exactly heaven for the machine, either; these little back-of-the-Mac jacks are among its more fragile components, never designed for such repetitive stress.

So wait a minute. They make multi-plug adapters for electrical wall outlets, right? They make faucets with a little hand sprayer coming out of the side. They make Y-connectors for telephone jacks. Why don't they make one for the modem port? What's the big hairy deal?

As I researched this column, assorted Silicon Valley engineers were laughing their heads off at my naïveté. Didn't I realize that "the plus-five voltage won't support the minimum acceptable impedance for serial peripherals" (or something to that effect)?

When the hilarity subsided, I managed to extract the following information. The Macintosh feeds a feeble drool of electricity into the modem port—just enough to power whatever's plugged in there. Even adding *one more* gadget, even a simple Y-jack, reduces the current coming out of each half. When current is diluted, some of the most common modem-port pluggables—the MacRecorder and most MIDI interfaces, for example—don't find the juice they expect. And they don't work.

The challenge is not just to find a switcher; it's to find one that works with everything.

## Manual A/B Switch Boxes

The simplest solution is a little gray box with a knob, called an A/B switch box. You turn the knob to channel your modem port's attention from one device to another. You can buy these things from electronics catalogs and such; Microcomputer Cable (313/946-9700) sells A/B, A/B/C, and A/B/C/D (two-, three-, and four-port) boxes for \$22, \$36, and \$42, respectively. Those prices don't include the plain old StyleWriter cable you need to connect the box to your Mac.

In the coming paragraphs, you'll find out about all kinds of fancy electronic solutions to the modem-port dilemma.



Most are simply glorified A/B/C/D boxes at ten times the price. To the certain disgust of electronics freaks everywhere, I maintain that it's actually easier to turn a physical knob than to open a desk accessory and click on a selection.

Ah, but, for the same reason the hero never gets killed ten minutes into the movie, I wouldn't start the column with this idea if it solved everything. The problem, of course, is the aforementioned MacRecorder-MIDI failure, hereafter known as the MR-MIDI issue: the A/B

split saps the modem port's tiny trickle of electrons. (MIDI interface models equipped with their own power cords are immune to the MR-MIDI problem.)

## Axion Switch

The next step up from a manual box is the Axion Switch (Axion, 408/522-1900; \$129). It's the closest thing the Mac has to those multiplug wall-socket adapters. It's a gracefully designed, T-shaped gray thing that plugs into our favorite jack. You can plug three devices into the T. Axion's hassle-free idea: you switch your Mac from one device to another from the menu bar.

The Axion Switch is subject to Ye Olde MR-MIDI Problem. The Axion engineers, however, were savvy enough to foresee the trouble. For an extra \$20, they will sell you a supplementary power cord that grabs a few fractions of a watt from, of all places, your *keyboard* jack. The power cord's two dangling wires, combined with the incoming cords from your equipment, creates quite a cacophony of cables. But hey—cords, schmords—the thing *works*!

## Port Juggler

The Most Promising Technology That Doesn't Quite Work award goes to the Port Juggler (Momentum, 808/263-0088; \$99). Picture a compact, black plastic box about the size of a Sony Walkman. It seems designed to wipe Axion off the map:

it's less expensive, it's got four ports rather than three, it requires no dangling power-cheater cord, and—here's the piece of resistance—the Port Juggler switches from device to device *automatically*. You teach the thing which device each of your programs prefers: America Online wants the modem, Finale wants MIDI, ClarisWorks wants the StyleWriter, and so on. After that, the correct device gets activated automatically when you switch programs. Pure genius.

*continues*



Well, on paper. In reality, the Port Juggler is not so much an Axion killer as it is a serial killer—it doesn't work with MIDI. The kindly inventors at Momentum worked feverishly through the harsh Hawaiian winter to solve the problem; at this writing, they're on the verge of unveiling version 2, which they say licks not only the MIDI nightmare, but the port-traffic problem, too (see the sidebar, "Ports in the Dark"). If this is true, the world will be a better place.

### MP-91 MultiPort

A few Macintosh-accessory junkies are about to become very, very happy. This baby (Silicon Valley Bus, 408/623-2300; \$229) has more openings than a Swiss-cheese factory: six serial ports and—here's the twist—five keyboard/mouse jacks. These ADB ports accommodate an entire second-class of Mac add-ons: remote-control mice, some digitizing tablets, certain modems, and some other devices. (You can use only two of the serial ports simultaneously—your network or printer will almost certainly be on one of them—but you can use all of the ADB ports at the same time.)

Whereas the Axion and Port Juggler boxes sit in the cable-crossed wilderness behind the Mac, the MP-91 MultiPort is groomed for public display. It connects to your Mac in three places—the modem, printer, and ADB ports—via thin, gray, 5-foot extension cords. The box itself is the size of a paperback romance novel and sits on your desk, making its 11 jacks immediately accessible.

The MultiPort's desk accessory for switching ports isn't nearly as handy as the Axion's menu-bar switcher. Otherwise, the thing works great.

### QuadraLink

So far you've been reading about modem-port switchers. How would you react to finding out about a modem-port multiplexer—a device that actually gives you four ports all working *simultaneously*?

Well, you know me. I went wild. I canceled my appointments and turned off the phone. I tore open the QuadraLink—a plug-in NuBus board—as though it were a shiny red sled I'd found under the tree. Imagine: four ports at once! I could download while listening to the synthesizer! I could print labels while doodling on a Wacom tablet! I could—I could...

No, I couldn't. It turns out that the QuadraLink's multiport talents rely on a piece of Apple software (built into System 7) called the Communications Toolbox, or CT. This little module serves as a behind-the-scenes patch bay for Macs with additional serial ports. All CT-aware

programs can use the QuadraLink's ports simultaneously.

Except guess what? Other than modem programs, I can count the number of CT-aware programs in the universe on two toes. And without CT savvy, the QuadraLink (Applied Engineering, 214/241-0055; \$219) is little more than an electronic switch box, just like the Axion or the Port Juggler—and one that suffers from MR-MIDI disease, at that. Worse, switching between ports requires a slog to your Control Panels folder.

Fortunately for MR-MIDI sufferers, the QuadraLink leaves your actual modem and printer ports empty. Brilliant idea: snuggle your MIDI and MacRecorder happily into those real ports, and plug everything else, including your printer or network, into the QuadraLink itself. Of course, you can still use only two ports at a time, exactly as you could before the QuadraLink, but at least it all works. (If you use high-speed modems on pre-Quadra Macs, you may prefer the port-speed goose-up provided by the \$366 QuadraLinkDMA card.)

### Hurdler Serial Board

The Hurdler is the QuadraLink's blood rival. The pros and cons of this NuBus card are exactly the same as the QuadraLink's except that you can't plug your AppleTalk connector into this one. You can use the Hurdler's four ports simultaneously only with CT-aware programs, the MR-MIDI problem persists, and you use a control panel—an ancient-looking

one appropriated from those old Prometheus internal modems—to switch ports. To top it off, Creative Solutions (301/984-0262) wants \$379 for the four-port model. Unless you're a techie running a BBS out of your home or something, I would pass it up.

### The Upshot

If you have neither MIDI gear nor a MacRecorder, get yourself a manual switch box. It'll save you a lot of money compared with the electronic solutions, and heaven knows, you'll suffer fewer extension conflicts.

If synthesizers and microphones do, in fact, vie for a place at your serial trough, it's a no-brainer: get the MP-91 MultiPort, with its festival of jacks. (But what about the above-mentioned virtues of the Axion Switch and the QuadraLink? Get this: due to a freak alignment of the planets, at press time Applied Engineering was no longer in business. At the same time Axion's message machine said the company was restructuring. Sorry if I got your hopes up.)

Apple makes computers that scream at 80MHz, obey spoken commands, and fit inside your wallet. Yawn. Wake me when they add another modem port. **m**

Contributing editor DAVID POGUE is the author of the number one Mac best-seller *Macs for Dummies* and its inevitable sequel, *More Macs for Dummies* (both IDG Books Worldwide, 1994). He lives in Manhattan, usually crouched behind his computer among the dust bunnies.

## PORTS IN THE DARK

If you decide on one of the electronic port-switchers, attempt to buy it with a credit card and a money-back guarantee. As my friends the Silicon Valley engineers emphasized, serial-port doctoring is a black art with plenty of gray areas. Trying to get multiple programs to share a single port without squabbling is like juggling rattlesnakes.

Momentum's Murat Bicakci has a good analogy. "It's like a big family with only one bathroom," he says. "Some people knock politely to see if the bathroom's occupied. Others just barge right in." (He calls Global Village's fax-modem software well behaved, and says that the StyleWriter driver seizes the port without regard to other programs' activity.) Furthermore, once they are in the bathroom, some people refuse to come out (MIDI programs, for example); others stay in as long as they wish, brushing their hair and teeth, but vacate courteously if somebody else knocks on the door (Faxstf fax-modem software).

The point: Whichever switcher you choose, always turn it to the appropriate virtual jack *before* launching a serial-seeking program. If you turn your switcher from modem to MIDI *after* starting your MIDI music program, for example, the program won't work—and you may get a system freeze or crash as a bonus.

Even then, no matter which switcher you use, no matter how many optional power cords you add, some devices may not work properly with some software. The complications most often cited involve the AV Macs' Geoport (which doesn't work with *any* external switchers), Apple Remote Access, Wacom tablets, and Faxstf software.



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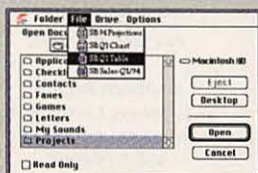
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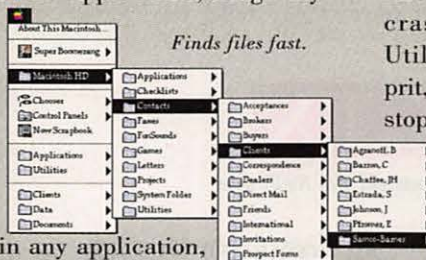
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# PowerPC to the People

*How Apple RISC'd all and won*

**L**AST MONTH I BEGAN TRACING the tale of the Power Macintosh's development. In 1990 not one but two groups at Apple were working to develop a powerful RISC machine that would position the company for greatness in the twenty-first century. The first team, originally code-named Jaguar and later Tesseract, was a well-supported group of some 30 engineers working on a sophisticated high-end machine that would be a clean break from the Mac's past. The other group, code-named Cognac, was a small but scrappy band that sought to design a low-end RISC computer that was an improvement on the Mac, not a departure from it.

In the summer of 1991, company execs kicked the ground out from under both teams by signing an agreement with IBM, the dark force that Apple had once opposed bitterly. One of the key components of the deal was the agreement to collaborate with Motorola on a new microprocessor based on IBM's RISC chip. This chip would be the engine to drive a new generation of mighty machines from both Apple and IBM.

Both the Tesseract and Cognac teams were stunned by the news. Not only did they have to meet a new deadline—January 24, 1994—but they had to create machines around a microprocessor that wasn't even designed yet! The first chips, based on an IBM design, were due from Motorola in the fall of 1992. Apple engineers were skeptical. After all, there had been all sorts of deadline problems with Motorola's 68040 chip, and Motorola was one unified company. How could a consortium attempting to combine such opposing cultures do better?

## Culture Club

But in one of the first meetings between Apple and IBM engineers, a telling incident occurred. The IBM'ers dressed in blue jeans. The Apple corps wore ties. Each group had attempted to make the other one feel at home. And as it turned out, there was an ecumenical atmosphere at Somerset, the building in Austin,

Texas, that was the design center for the PowerPC chip.

Good thing, too, because there was a lot of work to do. IBM's 601 chip, the first in the PowerPC series, needed almost a "ground-up redesign," says Paul Nixon, whom Apple recruited from Texas Instruments to head its Somerset contingent. At the same time, engineers from three companies worked on the design for the next two chips, the more efficient 603 and the lightning-fast 604.

Back in Cupertino, the Cognac and Tesseract teams were working frantically to design the computers themselves. Since the consortium creating the PowerPC chips agreed that the microprocessor would fit the bus design planned for

ly socketing it up to a NuBus card and hooking it into a Mac. "On Monday I got the card," says Gary Davidian, the team's emulation expert. "Tuesday we powered up. On Wednesday we were trying to boot the Mac ROM. That night we broke something, so on Thursday we got a new card. Thursday night we booted Mac software. And on Friday we demoed it."

Then the team got the chip into its box. On October 3, at approximately 5 a.m., the first prototype of a Power Macintosh using an actual 601 chip was booting the Finder.

## Tesseract Axed

Things were not going as smoothly with the Tesseract team, which Apple execs had judged the more important project. Near Christmas of 1992, the Tesseract team realized it could not possibly ship in the early 1994 time frame. By March Apple concluded that the project was beyond redemption, and it pulled the plug on Tesseract. It was now less than a year from Apple's planned date for shipping the Power Macs, and as McHenry notes, "there was no high-end product." The whole PowerPC effort hinged on getting a replacement—fast. Apple's only hope, really, was if Cognac's machine could somehow be modified into a more powerful, feature-laden model.

"We had thought about that," says McHenry, revealing a coy political acumen that comes from ten years of computer design at Apple. All along, it seems, McHenry's squad had designed its Mac so that the CPU could be expanded. With a new deadline of March 1994, the Cognac team began transforming its modest creation into the very high-end machine that stymied its rivals.

The original low-end model was called Piltown Man, or PDM for short. *continues*

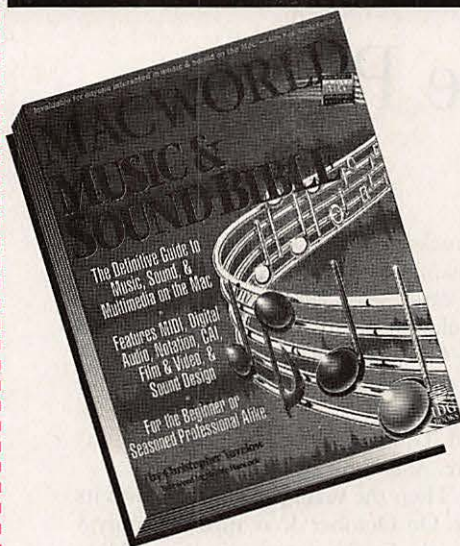


Motorola's original RISC chip, Cognac leader Jack McHenry and crew knew some of the basic structure of the low-end computer they were building. The tricky part was keeping close track of what was happening in Austin—any change in the PowerPC chip might have implications for the Apple machine.

The PowerPC 601 chip arrived in Cupertino on September 3, 1992, inside a package covered with Christmas wrapping. Cognac's prototype wasn't quite ready to go, but McHenry's team pounced on the chip anyway, immediate-



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The high-end model was dubbed Cold Fusion. Then a midrange version was added and code-named Carl Sagan, perhaps in honor of the billions and billions of dollars Apple hoped to reap from it.

#### Brady's Bunch

Once the hardware issue was settled, the PowerPC focus turned to software. In effect, Apple had to fast-forward into the next century with a successor to System 7. To manage the effort, Apple tapped Phillip Koch, a RISC expert who had been doing research at Dartmouth College. But Koch had difficulty recruiting Apple's top engineers for his team. "It was hard to get excited about building system software for a chip that was going to be in an IBM computer as well as Apple's," he says. "And it was also a case of 680X0 chauvinism."

James Gable, who moved from the Tesseract team to manage the entire PowerPC effort, was worried. "The software estimations were overly optimistic. We had a prototype, but very little native code running." His fears were confirmed when Sheila Brady, a brilliant and profane engineer, was recalled in late 1992 from a sabbatical at Harvard University to beef up the PowerPC software effort. She took one look at the massive chart with various projected delivery dates and judged the deadlines as unreliable.

Koch and Brady methodically gathered a team and began to resolve the key issues in the PowerPC operating system. The most important question was whether it would use the powers of the machine to integrate new features. Would it look different from System 7?

"Which comes first?" asks Jon Fitch, a hardware designer on McHenry's team, by way of explanation. "Should we present a high-performance computer with a high-performance interface? We decided that the transition [to a new interface] would be too abrupt. After all, we're building *Macintoshes*."

Adding even one obvious new feature to the Power Macintosh interface was judged too drastic. "So we ended up burying the differences," says Brady. But underneath the surface, the new OS was drastically rewritten. Gable ticks off some details: "All of QuickDraw is new, the memory manager is new, QuickTime is rewritten." But on screen the interface is identical to System 7.

The software turned out to be a dual success. True to the intentions of the Cognac team, it ran the current Mac software at speeds comparable to Quadras. Meanwhile, its familiar trappings cleverly concealed the fact that this operating system would one day accommodate the

innovations conceived of by the now-defunct Tesseract group—telephony, voice recognition, multimedia, and all sorts of exotic interface improvements.

"We began with a core of five to ten software people and turned the company around," says Phil Koch. "It's clearly obvious that this is going to be the future at Apple."

#### Living Proof

The proof of this came when Apple began showing the PowerPC to developers. There were two sorts of tests developers were interested in: how would their current software run on the emulator, and how easy would it be to port a current application to the native code that would take advantage of the PowerPC's RISC speed? The first question was answered at a developers' conference in May 1993, when software companies were invited to test their applications on the PowerPC. "We offered a bottle of champagne to anyone who could break the emulator," says McHenry. At the end of the conference, not a cork had been popped.

The second question was resolved fairly neatly once developers discovered that they could port their applications to PowerPC's native code with only a few days' work. This surprised even Apple. "We thought we'd have zero native applications when we shipped the machine," says Jon Fitch. Instead there were about 30 applications; the company expects hundreds by the end of 1994. Apple, obviously, had done something right.

There seems to be a common thread in the development of every important Apple computer: it is invariably the engineers, and not the top managers, who realize what is really needed. Apple's hands-on wizards have always been able to come up with solutions before their leaders, wallowing in stock options and six-figure salaries, even understand what the problems are. The Power Macintosh is no exception. While the upper echelons at Apple struggled with boardroom coups and pink-slip distribution, Jack McHenry's team coolly saved the company.

McHenry says only that he feels proud to have been associated with Apple's new flagship product. After all, he came to Apple ten years ago for the sole purpose of designing new Macintoshes. "I remember the time of the Macintosh SE and the Mac II," he says. "It was a time when Apple could remake itself in terms of market share. We're there again with the PowerPC." ■

STEVEN LEVY's latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).



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For your own Personal Font, simply write the 26 words as well as the capital letters, numbers and punctuation found on the back of this page. From that sampling, Signature Software font designers will individually convert your handwriting into a custom font which duplicates the unique way you create each word - not

just each letter. Your font will include your signature and will even have a name which you specify.

#### HANDWRITING FROM THE KEYBOARD.

Personal Font captures your handwriting at its best. Your font has the same style and character as your own handwriting - without the inconsistencies and inkblots! With your own Personal Font in the Font Menu you'll find yourself creating handwritten notes without hesitation - straight from your keyboard!

Since each order is custom, please allow two to four weeks processing time. If you're in a hurry, for an extra \$20 Signature Software will ship your order within five working days.

#### Actual Handwriting vs. Personal Fonts:

*Peter's actual handwriting.*

*Peter's Personal Font.*

Peter Matthews - Toronto, ONT

*Colin's actual handwriting.*

*Colin's Personal Font.*

Colin Johnson - Portland, OR

Your Personal Font can be installed and used as simply as an "ordinary" font. It appears in your menu and functions just like any other typeface in your computer.

#### System Requirements:

Mac - System 6.05 or higher

PC - Windows 3.1

Postscript printers or interpreters. On non-Postscript printers, characters will be disconnected, just as they appear on the screen, similar to this.

You're looking at a font of my handwriting. If you look closely, you'll find that each character is tailored to the characters around it. The font - by itself - does this automatically. For example, look at my "s" letters in the word "subsystems." When I filled out the form on the next page, I connected most, but not all, of my letters. Even if you don't connect ANY of your letters, everything you'd like to do in long-hand you can now do straight from your keyboard - including numbers, letters, punctuation, and your signature - in any size or style. Just carefully write 26 words and a few symbols once, and from then on all your handwriting will be at its best. I'm proud of my Personal Font and hope you enjoy yours, too!

Dave Fenwick  
Signature Software, Inc.  
(800) 925-8840



Signature  
Software, Inc.

489 N. 8th St. Suite 201 1-800-925-8840  
Hood River, OR 97031 1-503-386-3221

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### ORDER YOUR FONT!

Send your completed form to:

Signature Software, Inc.  
489 N. 8th St. Suite 201  
Hood River, OR 97031

Because each order is custom please allow 2 to 4 weeks. Add \$20 for 5 day processing. (48 hour processing is available).

\*\$7<sup>95</sup> special handling includes personalized disk, personal test document and copy of original form.

Price Reduction!  
\$229<sup>95</sup>  
\$99<sup>95</sup>  
limited time

+ \$7<sup>95</sup> shipping  
and special handling\*  
(Note: all prices \$US)

Signature Software  
Personal Font™

Now for Mac  
AND  
Windows!

Dealer Inquiries Welcome

"For those times when Palatino or Arial just won't do, fonts from Signature Software come to the rescue."  
-Computer Shopper  
"I recommend these fonts for each and every person who has heard (or read) the words, typing is impersonal."  
-MacWorld

Also Available: **SUPERscripts** Cursive Font Pack  
Five Fantastic  
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ONLY \$49<sup>95</sup>

**Special Cursive Handwriting Font Bundle**  
Receive BOTH Personal Font and SUPERscripts for the  
unbelievably low price of \$139<sup>95</sup>

NAME

COMPANY

ADDRESS

CITY

STATE

ZIP

COUNTRY



CARD NUMBER

(circle one or enclose check)

CARD EXPIRATION

PHONE

CARDHOLDER'S SIGNATURE

☐ YES! Rush me my Personal Font in 5 working days for \$20 extra

○ 3.5"  
○ 5.25"



(circle format  
desired)



# Personal Font™

The Original Curved Handwriting Font

Now for MAC  
AND  
WINDOWS

## NAME YOUR FONT!

The name must be seven alphabetic characters or less.

--	--	--	--	--	--	--

## INSTRUCTIONS:

1. Name your font and write your signature (up to four parts).
2. Write the words shown within each box using the broken lines as a base.
3. Print naturally and consistently. Practice first on a separate sheet of paper. Remember, what you write here will become the final font.
4. Use a fine line rollerball or fibertip pen. **Do not use ballpoint pens or pencils!**
5. Use the grid lines in the boxes as an aid to

maintain consistent height and slant. Be sure capital letters are proportional to lower case letters.

6. Write your capitals normally. Consider the appearance of capitals when at the beginning of words AND when words are all capitalized. Don't forget the punctuation!

7. Strike out mistakes and write corrections nearby. Signature Software can even make changes after you receive your font!

Signature (your name)

adjoint

bowman

cyclops

doubt

egtype

forgiven

grocery

hydrodyke

ionize

jewfishes

kagvels

lysozyme

mojxe

novque

oxyfobe

polygyne

quote

rybema

skyque

toyjoke

unfaxed

vogue

waywhips

xylose

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{ 3 4 }

[ 5 6 ]

&lt; 7 8 &gt;

9 0





# Avoiding Disaster

*You can't prevent the worst, but you can prepare for it*

**T**HE LOS ANGELES EARTHQUAKE that ripped through the headquarters of Dataproducts Corporation in January taught the peripherals company a difficult lesson. The office LAN had been backed up just before the quake, but company data was lost because some engineers hadn't backed up personal files.

"It's important to back up, back up, and back up your computer," says Jim Christian, the director of marketing for Dataproducts. Despite the lost data, the company was back in business in three days, because local employees worked at home and regional salespeople took over customer orders.

Dataproducts faced an earthquake, but power surges, hardware failures, and software problems can be just as challenging for computer-dependent companies. It's no picnic to lose your electronic lifeline; on average, by the sixth day there's a 25 percent drop in daily revenues for companies that lose their computer systems, according to a 1988 report from the University of Texas at Arlington.

## Planning Ahead

Wylie Crawford is president of Kenwood Associates/US Connect, a network system integrator company in Chicago. Crawford recommends that you consider these several issues in preparing for potential disasters.

- What types of emergencies might affect your company? They could range from a custom database with a critical flaw to fire.
- What impact would each type of disaster have on your business? A crashed hard drive might slow down your ability to fulfill orders, while a flood could stop it completely.
- How long would each emergency affect your business? A power failure might last six hours, whereas a toxic spill might take six weeks to clean up.
- How can you negate or reduce the affects of each type of disaster? Consider your resources, from people to equipment, including backups to surge protectors to uninterruptible power supplies.

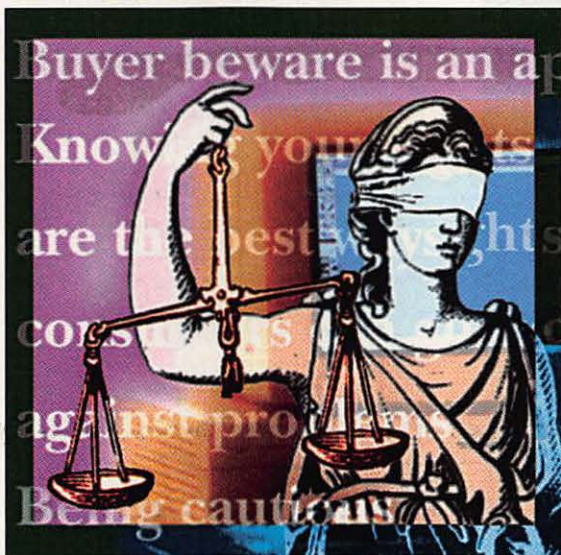
Because disasters can kill businesses as well as people, it's critical to prepare for the worst. Several companies specialize in devising and testing business-recovery plans, as well as providing emergency replacement equipment and facilities. Comdisco (708/698-3000) of Rosemont, Illinois, and Sungard Recovery Services (610/341-8700 or 800/247-7832) of Wayne, Pennsylvania, both work often with government agencies and large companies that use mainframes or Intel-based PC networks; but they also offer some services for Mac-reliant firms. For a monthly subscription fee, Sungard's QuickShip program, for example, provides replacement Macs.

I asked these two companies, experts, and Mac developers who have survived disasters for advice that could benefit

products, and deliver merchandise. After the earthquake, Dataproducts was able to function by temporarily shifting sales activity to field offices outside L.A.

- A place where a company can continue conducting its business. That might be a regional office, employees' homes, or another business that is willing to offer aid in the case of disaster. Some companies, for example, make mutual-aid agreements to share office space and equipment in case of emergency.

- The information that supports the company's business. Employee phone lists, supplier contacts, outstanding orders—anything and everything critical to maintaining the company, on disk or on paper, needs to be identified and accessible. Remember that a lot of vital information lives outside networks on the hard drives of individual employees.



## HSC's Experience

Many small companies don't have disaster-recovery plans, but HSC Software had most of the bases covered after the shaking stopped in Southern California. As part of its disaster plan, the Santa Monica-based developer of Kai's Power Tools requires that its staff have home access to online services. All HSC employees have computers and modems at home, along with accounts on America Online and Apple-Link, according to HSC chairman and CEO John

Wilczak. As a result, HSC employees knew how to respond in the wake of the earthquake.

Thanks to functioning local phone lines, HSC could operate in cyberspace. Wilczak established a live private chat room within HSC's AOL forum for real-time business communications among staffers. Because he (and other managers) keep a list at home of HSC's 50 employees and their online accounts, Wilczak could send messages within a few hours of


*continues*



# HEADS, IT'S REAL. TAILS, IT'S FAKE.

It's your choice. A little more than 50 percent of all business software in use today is pirated. If you buy it, you could end up with virus-ridden, phony software that has no documentation or product support.

Selling or copying pirated software without authorization is against the law, with severe criminal and civil penalties including imprisonment of up to five years, fines of up to \$250,000, or both. If you suspect the sale or use of pirated software, call the BSA Anti-Piracy hotline:

 (800) 688-BSA1 (2721)

 **BSA** Business Software Alliance

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the earthquake asking all employees to work via AOL. "I did file sharing with about 20 people," says Wilczak.

Critical business information was also available to HSC shortly after the quake, thanks to rigorous backup procedures. "All of our machines get backed up every night, whether it is marketing, accounting, or code," says Wilczak. HSC uses an 18-gigabyte DAT drive for data backup, and individual employees are held responsible for this critical task. "It's the kind of thing that's taken very seriously in the company," says Wilczak. "This is your work. If you don't back up and it's lost, it's very serious." Every day one backup tape

goes into a bank safety-deposit box for security; HSC's technical-services director keeps a duplicate tape off-site.

## Checklist for Action

To protect your company and its business, you need to develop a plan, test it, and update it as the company grows or changes. Testing is critical; give yourself time before a disaster occurs to discover if your backup media is unreliable or time allotted for restoring a network is unrealistic. And if you undergo an emergency, apply what you learn to your disaster plan.

Dataproductions, for example, lost equipment and engineering documents to water damage from a sprinkler system that broke in the quake. Now the company plans to put engineering drawings away in a waterproof, fireproof container at the end of each day.

Working Software, a Macintosh developer in Santa Cruz, California, survived Northern California's 1989 Loma Prieta earthquake relatively unscathed. Still, the company learned several lessons. Company president Dave Johnson recommends placing rubber mats between Macs and desks so the machines won't slide off during tremors, and showing employees emergency exits (and giving them flashlights to find them should the electricity go out). Johnson also suggests stashing an inexpensive, standard phone somewhere in the office. Working Software's phone system needs electricity to function; the earthquake knocked out the region's power, but a standard home phone would have let him receive calls and call out.

Creating a disaster plan won't work unless you follow through. Disseminate the plan. Safeguard your critical business information. Share the disaster plan with employees. Make sure that your staff knows where to meet and what to do in case of emergency. Ask key managers to keep backup copies of the disaster plan at home; keep another copy in a bank's safety-deposit box or another secure place off-site.

And if you do nothing else to protect your company, keep your Macs backed up (see *Working Smart*, April 1994, for tips). Maintain at least two sets of backup data, and store one off-site in a safety-deposit box or another secure place.

"Don't wait," advises Wilczak. "You never know when disaster is going to hit or why." **m**

## SERVICE HERO

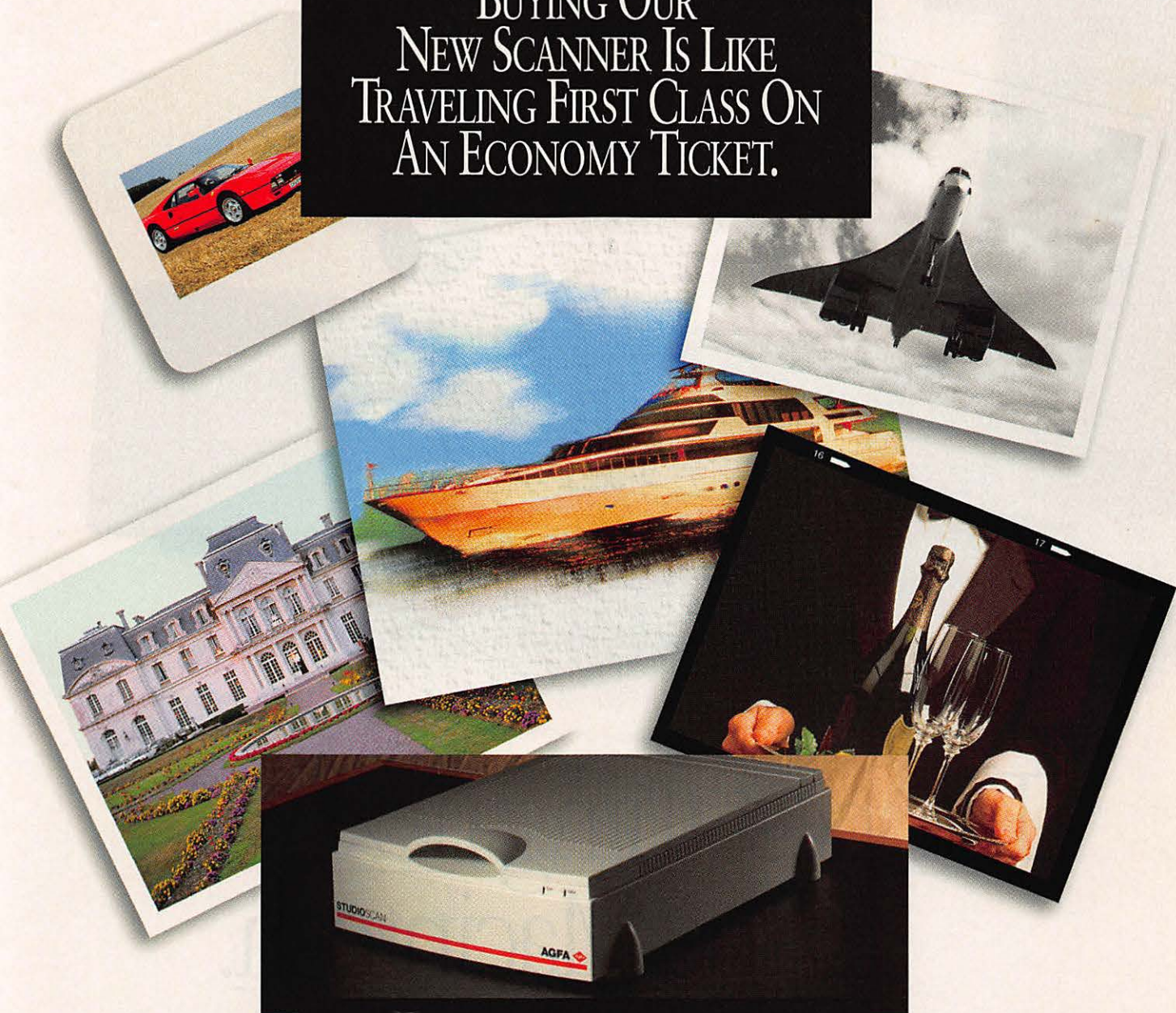
**S**peaking of disasters, Amir Yavari of Microtek Lab made a lasting impression on two readers in Ames, Iowa, despite difficult conditions. Kurt Plagge and David Sauke write in praise of Yavari and Microtek for service in the aftermath of January's earthquake in Southern California. Plagge called Microtek, in Redondo Beach, California, for advice on a malfunctioning scanner two days after the earthquake and was sure he wouldn't hear from the company for weeks. Instead, the next day, Yavari "diagnosed our problem, sent the needed parts in overnight mail, and got our scanner up and running in less than three days despite definite distractions beyond his control," writes Plagge. "He told me on the phone that about half the employees at his location weren't able to make it to work yet. We were definitely impressed, [and] relieved to have our scanner working again."

Shreekrishna Datye of Iceland writes of the "exemplary post-sales service" Kent Marsh provides. The reader commends Kent Marsh for responding promptly when Datye discovered that the universal version of FolderBolt did not work with Icelandic System 7. The company made the program compatible with that system and sent Datye the latest program at no charge. "As a foreign customer," writes Datye, "I have never experienced better service from any other American software company."

Send nominees for sainthood to Service Heroes, *Macworld*, 501 Second St., San Francisco, CA 94107, or via Internet (Branscum@AOL.com). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.



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It used to be that unless you had a lot of money to spend, a scanner was simply out of the picture. But now there's Agfa StudioScan, the new feature-rich scanner that's wonderfully affordable.

StudioScan offers the speed and efficiency of one-pass scanning for both black-and-white and color images. Its flatbed design accommodates sizes up to 8.5" x 14", and an

optional transparency module scans 35mm slides up to 8" x 10".

What's more, StudioScan comes with a complete software package, including Agfa's proven labor-saving FotoLook,<sup>™</sup> FotoTune LE,<sup>™</sup> FotoSnap<sup>™</sup> programs, and Adobe PhotoShop LE. Compatible with both Macintosh and PC systems, StudioScan actually guides an entry-level user through the entire scanning process.

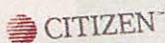
To find out more about StudioScan's high-quality imaging for your layouts, in-house publications, illustrated reports, and more, call 1-800-685-4271 today. And discover the Agfa scanner that offers first-class features at an economy price.

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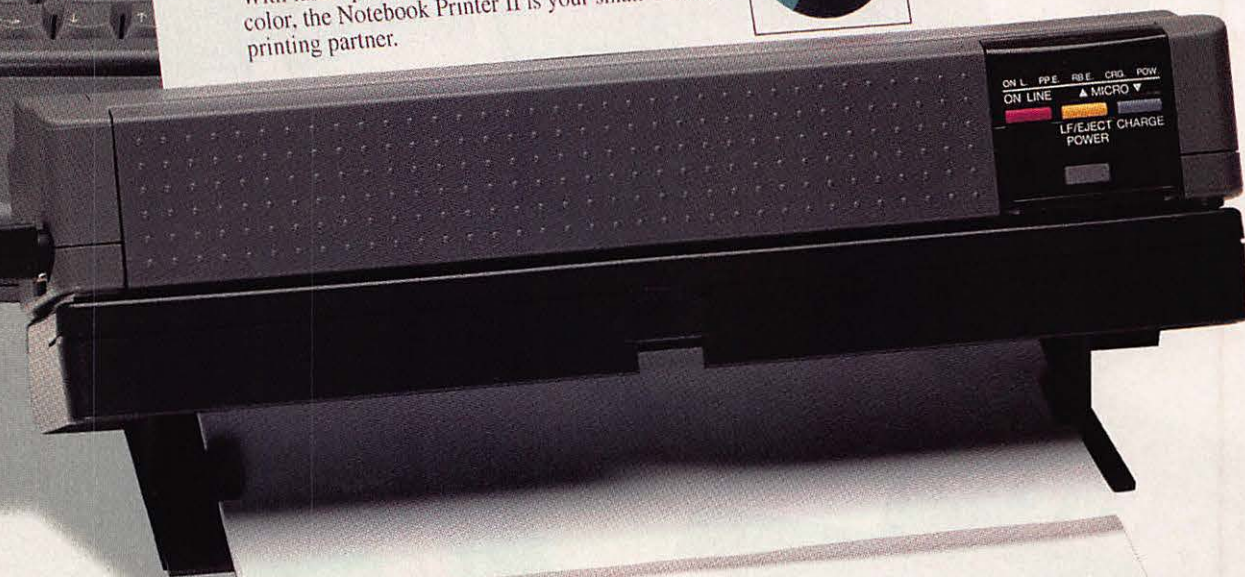
Circle 158 on reader service card





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At home, at the office, or on the road, the Citizen Notebook Printer II works where you work. With laser-quality text, graphics, and special-image color, the Notebook Printer II is your small-business printing partner.



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## CITIZEN™

The Notebook Printer II. It works where you work.







# Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

*Macworld Editors' Choice* is a complete listing of the hardware and software products selected as the best of their type in *Macworld's* comparative articles. A ♦ next to a product indicates that we chose more than one product in that category.

## Hardware

### MONITORS

#### BLACK-AND-WHITE MONITORS, May 93

**Portrait monitor:** 15-Inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; \$399, with video-display board \$549.

**Two-page monitor:** ♦ L-View MultiMode; Sigma Designs, 510/770-0100; \$1099, with video-display board \$1398. ♦ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; \$699, with video-display board \$798.

#### COLOR MONITORS, Oct 93

**16- and 17-inch:** ♦ ErgoView 17; Sigma Designs, 510/770-0100; \$1349.

♦ MultiSync 5FG; NEC Technologies, 708/860-9500; \$1355 (NEC's estimated dealer price).

#### GRAY-SCALE MONITORS, May 93

**Portrait monitor:** Pivot Display; Radius, 408/434-1010; \$849, with video-display board \$1148.

**Two-page monitor:** MultiMode 120, SilverView Pro; Sigma Designs, 510/770-0100; \$1099, with video-display board \$1299.

#### SMALL COLOR MONITORS, Jan 94

**14-inch display:** ♦ Sony CPD 1430; Sony Corp. of America, 800/222-7669; \$779.95. ♦ Nanao FlexScan F340iW; Nanao USA, 800/800-5202; \$799.

**15-inch display:** NEC MultiSync 4FG; NEC Technologies, 708/860-9500; estimated street price \$755.

### NETWORK HARDWARE

#### HARDWARE ROUTERS, Jul 93

**Under \$1500:** EtherRoute; Compatible Systems, 303/444-9532; base model \$1495 (no TCP/IP support).

**Between \$1500 and \$3500:** InterRoute/5; Farallon Computing, 510/814-5000; \$3299 to \$3499.

#### HIGH-SPEED FAX MODEMS, Oct 93

Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold \$499, Silver \$429.

### POWERBOOK TOOLS

#### DUO DOCKING CONNECTORS, Feb 93

PowerLink DeskNet; E-Machines, 503/646-6699; \$699.

#### EXTERNAL HARD DRIVES, Feb 93

♦ Companion 120; APS Technologies, 800/874-1428; \$599. ♦ PocketDrive 120MB; La Cie, 503/520-9000; \$699.

#### INTERNAL FAX MODEMS, Feb 93

♦ PowerModem series; PSI, 408/559-8544; \$195 to \$495. ♦ PowerPort series; Global Village Communication, 415/390-8200; \$229 to \$499.

### PRINTERS

#### COLOR PRINTERS, May 93

**Dye-sublimation:** ♦ ColorStream/DS; Mitsubishi International, 408/980-1100; \$9950. ♦ Phaser IISD Color Printer; Tektronix, 503/682-7377; \$9995.

**Thermal-wax:** ♦ ColorScript 210; QMS, 205/633-4300; \$4995. ♦ Personal ColorPoint PSE; Seiko Instruments, 408/922-5800; \$2999.

**Low-end liquid-ink:** HP DeskWriter 550C; Hewlett-Packard, 800/752-0900; \$719.

**Midrange liquid-ink:** HP PaintJet XL300; Hewlett-Packard, 800/752-0900; \$2795.

**Solid-ink:** Phaser III PXi Color Printer; Tektronix, 503/685-3585; \$9995.

#### PERSONAL PRINTERS, Sep 93

**Ink-jet:** StyleWriter II; Apple Computer, 408/996-1010; \$359.

**PostScript laser:** TI microLaser Series; Texas Instruments, 512/250-6679; \$1199 to \$1599.

**QuickDraw laser:** LaserWriter Select 300; Apple Computer, 408/996-1010; \$839.

#### WORKGROUP PRINTERS, Feb 94

**High-speed:** Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; \$5499.

**Best buy:** ♦ Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; \$2529.

♦ Hewlett-Packard LaserJet 4M; Hewlett-Packard, 800/752-0900; \$2329.

### SCANNERS

#### LOW-COST COLOR SCANNERS, Nov 93

**\$1300 to \$1600:** ♦ La Cie Silverscanner II; La Cie, 503/520-9000; \$1599.

♦ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; \$1599.

**Under \$1300:** Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; \$1299.

#### OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; \$995.

### SYSTEMS/STORAGE

#### DOUBLE-SPEED CD-ROM DRIVES, Jul 93

**Sheer speed:** Pioneer DRM-604X; Pioneer, 408/988-1702; \$1795.

**Overall value:** AppleCD 300; Apple Computer, 408/996-1010; \$599.

**Budget choice:** NEC MultiSpin 38; NEC Technologies, 708/860-9500; \$465.

#### HIGH-SPEED HARD DRIVES, Aug 93

**2.7GB drives:** ♦ Nova XL 2700; Microtech International, 203/468-6223; \$2999. ♦ Vista 3.5GB; Relax Technology, 510/471-6112; \$3499.

**SCSI-2 adapter:** QuickSCSI; PLI, 800/288-8754; \$499.

#### MACINTOSH UPGRADES, Jun 93

**SE accelerator (25MHz):** Quik30; Novy Systems, 904/427-2358; \$449 (without FPU).

**SE/30 accelerator (50MHz or 33MHz):** Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz \$999 (with FPU), 33MHz \$449 (without FPU).

**LC and LC II upgrades:** Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; \$599.

**Mac II accelerators:** ♦ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i \$1199, 33 \$2499.

♦ Universal PowerCache series; DayStar Digital, 404/967-2077; \$449 to \$999.

**Ilfx SCSI accelerator:** QuickSCSI; PLI, 800/288-8754; \$499.

**Quadra static-RAM cache card:** FastCache Quadra; DayStar Digital, 404/967-2077; \$299 for Quadra 700 and 900, \$449 for Quadra 800 and 950.

#### MIDRANGE HARD DRIVES, Mar 93

**Low-capacity drive:** La Cie Cirrus 240; La Cie, 503/520-9000; \$769.

**Notable technology:** DiamondDrive 510; Mass Microsystems, 408/522-1200; \$2089.

**Bargain:** APS Fujitsu 520; APS Technologies, 800/874-1428; \$1149.

**All-around quality:** hammer 525FMF; FWB, 415/474-8055; \$2799.

#### OPTICAL DRIVES, Dec 93

**3½-inch:** ♦ Epson OMD 5010; ClubMac, 800/258-2622; \$959.

*continues*



# Editors' Choice

❖ 128 MO; APS Technologies, 800/874-1428; \$899.  
**5 1/4-inch:** ❖ Sharp JY-750; ClubMac, 800/258-2622; \$1829.  
 ❖ Infinity MaxOptical 11m; Peripheral Land Inc., 800/288-8754; \$4113.

## VIDEO/DISPLAY

**24-BIT VIDEO CARDS, Apr 94**  
**Inexpensive acceleration:** PrecisionColorPro 24XP; Radius, 408/434-1010; \$599.  
**Full-featured acceleration:** Thunder II GX•1360; SuperMac Technology, 408/541-6100; \$4499.

**HIGH-END VIDEO EDITING, June 94**  
**Presentation Video:** ❖ MoviePak2 Pro Suite; RasterOps, 801/785-5750; \$4199. ❖ VideoVision Studio; Radius, 408/434-1010; \$4499.  
**Corporate Video (Offline):** Media Composer 400s; Avid Technology, 508/640-6789; \$14,995.  
**Corporate Video (Online):** VideoCube; ImMix, 916/272-9800; \$40,500.

**PHOTOSHOP ACCELERATORS, Apr 94**  
 PhotoBooster; Radius, 408/434-1010; \$999.

## Software

### ACCOUNTING/FINANCE

**GROWING A SMALL BUSINESS, Nov 93**  
**Small-business system:** M.Y.O.B.; Teleware, 201/586-2200; \$199.  
**Home office/personal finance:** MacMoney; Survivor Software, 310/410-9527; \$119.95.

### BUSINESS TOOLS

**STATISTICS, Oct 93**  
**Exploratory data analysis:** DataDesk 4.1; Data Description, 607/257-1000; \$595.  
**Comprehensive package:** SYSTAT 5.2.1; SYSTAT, 708/864-5670; \$895.

### CD-ROM

**TOP 10 CD-ROMS, Mar 94**  
**Overall:** Seven Days in August; Time Warner Interactive Group, 818/955-9999; \$79.99.

### COMMUNICATIONS/NETWORKS

**HIGH-SPEED FAX MODEM SOFTWARE, Oct 93**  
 Faxstf; Telefocus, 816/886-9800; \$79.

**NETWARE CONNECTIVITY, Sep 93**  
 NetWare for Macintosh; Novell, 801/429-7000; \$495 for 5-user license to \$2295 for 200-user license.

**SOFTWARE ROUTER, Jul 93**  
 Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package \$499.

**TERMINAL EMULATOR, Oct 93**  
 VersaTerm; Synergy Software, 215/779-0522; \$149.

## GRAPHICS

**2-D CAD, Jan 93**  
**Low-end:** BluePrint; Graphsoft, 410/461-9488; \$295.  
**Midrange:** PowerDraw; Engineered Software, 919/299-4843; \$795.

**3-D DESIGN, Aug 93**  
**Price for performance:** ❖ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; \$299. ❖ Alias Sketch 1.5; Alias Research, 416/362-9181; \$995.  
**All-in-one solution:** ❖ Infini-D 2.5; Specular International, 413/253-3100; \$695. ❖ StrataVision 3D 2.6.1; Strata, 801/628-5218; \$995.

**CLIP ART'S GREATEST HITS, Jan 94**  
**Overall collection:** ❖ ClickArt Studio Series; T/Maker Company, 415/962-0195; \$99.95 per volume. ❖ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; \$67.50 per month. ❖ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; \$74.95 per volume, CD-ROM \$149.95. ❖ Images with Impact series; 3G Graphics, 800/456-0234; \$99.95 to \$129.95 per volume, CD-ROM \$499. ❖ Typographers' Ornaments; Underground Grammarian, 609/589-6477; \$25 per volume; ten TIFF albums \$200; EPS volumes \$50 each.

**DRAW PROGRAMS (LOW-COST), Sep 93**  
**Budget draw:** Expert Draw; Expert Software, 305/567-9990; \$49.95.  
**Budget draw/paint:** UltraPaint; Deneba Software, 305/596-5644; \$79.  
**Beginners' program:** Aldus SuperPaint; Aldus Corp., 619/558-6000; \$149.95.  
**Overall:** Canvas; Deneba Software, 305/596-5644; \$399.

**FONT BUYERS' GUIDE, Mar 94**  
**Text-face collection:** Type On Call CD-ROM; Adobe Systems, 415/961-4400, 800/682-3623; \$99 (includes the ability to unlock two families from preselected packages) plus \$25 to unlock individual faces or \$69 to \$179 for unlocking families.  
**Display/decorative-face collection:** Fontek; Letra-set, 201/845-6100; \$39.95 per face.  
**Bargain collection:** Monotype ValuePack; Monotype, 312/855-1440; \$89 for 57 fonts.

**IMAGE DATABASES, Oct 93**  
 ❖ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; \$295.  
 ❖ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; \$249.

Vendors: Please write to Macworld Editors' Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

**PAINT AND IMAGE-EDITING, Sep 93**  
**Budget buy:** Expert Color Paint; Expert Software, 305/567-9990; \$49.95.  
**Overall program:** Fractal Design Painter; Fractal Design Corp., 408/688-8800; \$399.  
**Image-editing program:** Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; \$895.

## INTEGRATED SOFTWARE

**INTEGRATED SOFTWARE, Feb 94**  
 ClarisWorks; Claris Corporation, 408/727-8227; \$299.

## ORGANIZATION/PRODUCTIVITY

**CALENDARS, Jul 93**  
**Alarm system:** ❖ First Things First; Visionary Software, 503/246-6200; \$79.95.  
 ❖ Smart Alarms Plus; JAM Software, 203/630-0055; \$75.  
**All-around scheduler:** Now Up-to-Date; Now Software, 503/274-2800; \$99.  
**Meeting scheduler:** Meeting Maker; On Technology, 617/374-1400; five-pack \$495.

**SALES-AUTOMATION SOFTWARE, Oct 93**  
 ❖ Contact Ease; WestWare, 619/274-5053; one user \$395, five users \$1495.  
 ❖ CBS; Colleague Business Software, 512/345-9964; \$495.

**TEXT-RETRIEVAL SOFTWARE, Dec 93**  
**Small system:** On Location; On Technology, 617/374-1400; \$129.  
**Multuser system:** Personal Librarian; Personal Library Software, 301/990-1155; \$995.

## PRESENTATION TOOLS

**MULTIMEDIA AUTHORING, Mar 93**  
**Entry-level:** ❖ Action; Macromedia, 415/252-2000; \$495.  
 ❖ Passport Producer; Passport Designs, 415/726-0280; \$495.

## UTILITIES

**BRAVE NEW DOCUMENTS, Jan 94**  
**Application-independent document distribution:** Common Ground; No Hands Software, 800/598-3821; \$189.95.  
**Book-length documents:** FrameReader; Frame Technology, 800/843-7263; \$84.95.

**PRINTING, Sep 93**  
**PC-printer cable packages:** PowerPrint; GDT Softworks, 604/291-9121; \$149.

## VIRTUAL MEMORY SOFTWARE

**VIRTUAL MEMORY, June 94**  
**Virtual memory Software:** Virtual 3.0; Connectix Corp., 415/571-5100; \$99.  
**Memory Boosting Software:** RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; \$99. **m**



# Star Ratings

OVER 300 HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

*Macworld Star Ratings* lets you compare hardware and software products for the Macintosh by providing summaries of hundreds of *Macworld's* authoritative product reviews. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

## Software

### BUSINESS TOOLS

★★★★ **4D First 1.0, ACI US, 408/252-4444, \$295.** This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94

★★★★ **4D Server 1.0.1 (1.0.5), ACI US, 408/252-4444, \$1495 to \$3495.** Database server uses the ingenious multitasking technology built into 4D to make it appear that each client has the full resources of the server. If you use 4D on a network, you need this product. Jun 93

★★★★ **Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, \$195 to \$2495.** Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★★ **@Risk 1.1, Palisade Corp., 607/277-8000, \$395.** Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★ **BaseMap 1.0.1, GeoPoint, 415/957-1560, \$149.** For simple maps displaying simple data, this mapmaking tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

★★★★ **ClarisWorks 2.0, Claris Corp., 408/727-8227, \$299.** Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

★★★★ **Common Ground 1.0, No Hands Software, 415/802-5800, \$189.95.** Simple, robust document-interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★★★ **Cricket Graph III 1.5, Computer Associates International, 516/342-6000, \$129.** Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

★★★★ **DeltaGraph Pro 3, DeltaPoint, 408/648-4000, \$195.** At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94

★★ **EasyFlow 1.1, HavenTree Software, 613/544-6035, \$229.** The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93

★★★★ **Helix Express 1.0 (2.0), Helix Technologies, 708/465-0242, \$439.** This relational database has an iconic programming language that sometimes baffles programmers, but provides an easy route into basic data-handling for nonprogrammers. Jul 93

★★★★ **Helix Tracker 1.0, Helix Technologies, 708/465-0242, \$439.** Well-designed workgroup-document manager has strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★★★ **ithink 2.2.1, High Performance Systems, 603/643-9636, \$695.** Although it requires a real training commitment for effective use, this product is an attractive dynamic business-modeling system. It's a good bet for identifying cloudy spots in the crystal ball. May 93

★★ **Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, \$495 per client.** Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★★ **MacBarcoda 2.2.4, ComputaLabel, 508/462-0993, \$349 to \$895.** Simple-to-use desk accessory creates bar codes in EPS or Adobe Illustrator 1.1 format. DA cannot automatically create serial codes. Jun 93

★★★★ **MacProject Pro 1.0 (1.5), Claris Corp., 408/727-8227, \$599.** If you're working on a midsize project and like using PERT charts, this may be the project-management software for you. However, the multistep scheduling process and the limited integration between charts are frustrating if you prefer Gantt charts. May 93

★★★★ **Map II 1.5, ThinkSpace, 519/661-4006, \$395.** Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time

users who just like maps. May 94

★★★★ **MarcoPolo 2.0, Mainstay, 805/484-9400, \$395.** Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents, whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★★ **Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, \$395 to \$1995.** Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

★★ **Memorizer 2.0, Brains Software Engineering, 432-231-28973 (Austria), \$100.** Software records dictation, and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appetite and its propensity to crash. Aug 93

★★★★ **Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, \$695.** When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

★★★★ **Microsoft FoxPro for Macintosh 2.5, Microsoft Corp., 206/882-8080, \$495.** Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data (hundreds of thousands to millions of records) it offers excellent performance. Apr 94

★★★★ **Office Tracker 1.1, Milum Corp., 512/327-2255, \$195 to \$995.** The efficient user interface of this software sign-on board, in both single-user and networkable versions, makes it easy to learn and use; but it has some minor flaws. Dec 93

★★★★ **Project Scheduler 5, Scitor Corp., 415/570-7700, \$695.** For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

★★★★ **SpreadBase 1.0.1, Objective Software, 415/306-7410, \$695.** Business data-analysis tool is a unique combination of database and spreadsheet functions. It's worth a close look for power users, despite meager documentation and a cranky macro language. May 93

★★ **Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, \$179.95.** Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

*continues*



# Star Ratings

★★★ **Wingz 1.1ae, Informix Software, 913/599-7100, \$399.** Low-overhead spreadsheet offers advanced-math functionality, a competent calculating engine and superior charts; but is missing outlining, real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. Jul 93

★★★ **WordPerfect Works 1.2, WordPerfect Corp., 801/225-5000, \$249.** This program offers seven well-integrated and flexible modules. It has a few shortcomings, including some memory-management problems, but buyers should generally be pleased. Jun 93

## COMMUNICATIONS/NETWORKS

★★ **AccessPC 3.0, Insignia Solutions, 415/694-7600, \$129.95.** Utility translates most word-processor and some database formats, but it doesn't translate graphics and some of its translations result in data loss. Apr 94

★★★ **Crosstalk for Macintosh 2.0, Digital Communications Associates, 404/442-4000, \$195.** Commendable communications product has a feature set that well matches its competition. Still, the script editing is complex and you must manually enter phone numbers each time you use it. Apr 94

★★★ **Delrina FaxPro for Macintosh 1.0, Delrina Corp., 408/363-2345, \$129.** Fast, efficient fax software has an excellent address-book feature but also has some interface quirks and minor bugs. Feb 94

★★★★ **DOS Mounter Plus 4.0, Dayna Communications, 801/269-7200, \$100.** File-transfer and translation utility works with floppies, removable drives, and network volumes and supports wild cards in DOS extensions. Apr 94

★★★★ **EtherPeek 2.0.3, LocalPeek 2.0.3, TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, \$495 to \$995.** Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jan 94

★★★★ **MacLink Plus/Translators Pro 7.5, DataViz, 203/268-0030, \$149.** If your PC files are in archaic formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. Apr 94

★★★ **On The Air 1.0.1 (1.0.2), Digital Eclipse Software, 510/547-6101, \$79.99 to \$639.99.** Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. Aug 93

★★★ **On The Road 1.1, Connectix, 415/571-5100, \$99.** Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports some hardware, however, so check before buying. Dec 93

★★★★ **Silver Cloud 1.2, AG Group, 510/937-7900, \$495.** If you are administering a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

★★★ **SITcomm 1.0, Aladdin Systems, 408/761-6200, \$120.** Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. Apr 94

★★ **SoftPC 3.1, Insignia Solutions, 415/694-7600, \$499.** While the speed of this Windows PC emulator

is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

★★★★ **Timbuktu Pro, Farallon Computing, 510/814-5000, \$199 to \$1999.** Terminal-emulation product is a must-have for in-house technical-support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. May 94

★★★★ **VersaTerm 5.0, Synergy Software, 215/779-0522, \$195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it. Jan 94

## DESKTOP PUBLISHING

★ **AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/288-2860, \$69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

★★★★ **Aldus Fetch 1.0, Aldus Corp., 206/622-5500, \$295.** The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. Aug 93

★★★★ **Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, \$895.** Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. Nov 93

★★★ **Cumulus 1.1 (1.2), Canto Software, 415/431-6871, \$295 to \$895.** Good network support, plus a feature that creates a protocol file for recording user actions, make this image-cataloging program a good choice for workgroups. It doesn't have an image-preview feature, nor does it offer 32-bit thumbnails. Aug 93

★★★ **Expanded Book Toolkit 1.0.1 (2.1), The Voyager Company, 310/451-1383, \$295.** Using this hypermedia publishing program, average mortals can create highly functional multimedia books in a fraction of the time it would take to do the job unassisted. Be aware, though, that it's no QuarkXPress. Jun 93

★★★★ **FontMonger 1.5.7, Ares Software Corp., 415/578-9090, \$149.95.** Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create composite, subscript, superscript, and rotated characters. Sep 93

★★ **FotoTune 1.1, Agfa Division of Miles, 508/658-5600, \$795.** Color-management software has a capable engine, but it's not the complete color management system Agfa touts. Invisible tech support and poor documentation were only part of the problem. Apr 94

★★★★ **FrameMaker 4.0, Frame Technology Corp., 408/433-3311, \$895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real time-saver. Mar 94

★★ **ImageAccess 1.0, Nikon, 516/547-4355, \$495.** This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. Aug 93

★★★★ **Kodak ColorSense 1.0, Eastman Kodak, 716/253-0740, \$499.** Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. Oct 93

★★ **Kudo Image Browser 1.0 (1.1), Imspace Systems Corp., 619/272-2600, \$195.** This image-cataloging software cannot control thumbnail depth or compression and doesn't have a keyword feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. Aug 93

★★★★ **Print Shop Deluxe, Broderbund Software, 415/382-4400, \$50.** Even the most ham-fingered can create professional-looking greeting cards, signs, banners, letterhead stationery and calendars with these desktop publishing templates and graphics. While it's not a substitute for a high-end program, it is easy to use and inexpensive. Apr 94

★★★★ **QuarkXPress 3.2, Quark, 303/894-8888, \$895.** This upgrade adds the EfiColor XTension to ensure the greatest possible fidelity of color images and is a must-have for professional color publishers who use Quark. For others, the enhancements are welcome but minor enough that they provide little incentive to upgrade. Nov 93

★★★★ **SuperATM, Adobe Systems, 415/961-4400, \$149.** This upgrade to Adobe Type Manager lets you view Adobe-brand PostScript fonts on screen and output them at high resolutions, even when the corresponding printer fonts are unavailable. Although it has limitations, this is an outstanding advance in font technology and a tremendous value. May 93

★★★★ **Tableworks Plus 1.05, Npath, 206/392-7745, \$299.** Publishing utility adds a full table-editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. Jan 94

## EDUCATION

★★★★ **Decimal & Fraction Maze 1.2 (1.2.3), Great Wave Software, 408/438-1990, \$69.95 to \$89.95.** Education software weaves the threads of eight math curricula—from third grade to eighth, along with two levels of adult education—into an interesting and visually stimulating game. Jul 93

★★ **Dvorak on Typing 1.0, MacPlay, 714/553-3530, \$49.95.** Typing tutor offers solid lessons, but the small annoyances, such as never being able to take intermediate or advanced lessons without first passing a test, add up. Jun 93

★★★★ **How Computers Work, Time Warner Interactive Group, 818/955-9999, \$79.99.** Graceful, well-integrated CD-ROM tutorial guides the curious through brief but helpful explanations of basic computer technologies. Jan 94

★★★ **HyperStudio, Roger Wagner Publishing, 619/442-0522, \$179.95.** Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. Dec 93

★★★★ **MacGrade 1.5.5, CalEd Software, 800/795-0641, \$85 to \$245.** Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. Feb 94

★★★★ **Mavis Beacon Teaches Typing 2.0, The Software Toolworks, 415/883-3000, \$49.95.** If being entertained while learning to type interests you, this typing tutor provides varied environments, interesting lessons, and good games. Jun 93

★★★ **Millie's Math House 1.0 (1.1), Edmark Corp., 206/556-8400, \$49.95.** Math-education software provides ways for preschoolers to experiment with numbers and counting. It's engaging, but more advanced levels would keep children challenged longer. Jul 93



★★★★ **The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, \$395.** Foreign-language instruction on CD-ROM is a valuable educational tool and fun to use. The lessons are well paced, and the content is generally excellent and diverse. Jan 94

★★★ **The Secret Island of Dr. Quandy 1.0, MECC, 612/569-1500, \$49.95.** Clever package of gorgeous landscapes, catchy sounds, and tempting arcade-game puzzles uses math, logic, and reading skills. Although slow, it's fun for parents and kids. Jun 93

★★★ **Stickybear's Reading Room 2.2a, Optimum Resource, 803/785-7441, \$59.95.** Educational game with four activities takes a sedate but direct path to building primary-level reading skills. Jun 93

## ENTERTAINMENT

★★★ **BlackJack Trainer, ConJelCo, 412/492-9210, \$75.** Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. Oct 93

★★★ **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, \$49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining and informative game is for you. Oct 93

★★★★ **Falcon MC 1.0, Spectrum HoloByte, 510/522-1164, \$69.95.** Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

★★★ **Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, \$99.99.** Take a diabolical New York cabbie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade sections are hard to control, but overall it succeeds. Jan 94

★★★★ **Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3394, \$59.95.** In this game, the whip-wielding archaeologist goes looking for Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it diverting. Oct 93

★★★★ **Jewelbox 1.5 (2.0), Varcon Systems, 619/563-6700, \$49.95.** This gem of a game is strongly reminiscent of Tetris. The jewels fall into rows that disappear when you place three jewels of a kind together. Jun 93

★★★★ **The Journeyman Project 1.0 (1.2), Presto Studios, 619/689-4895, \$79.95.** Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

★★★★ **Maelstrom 1.03, Ambrosia, P.O. Box 23140, Rochester, NY 14692-3140, \$15 plus \$5 shipping and handling.** Fast-paced arcade game is loosely modeled after Asteroids, the Atari classic. Maelstrom features superb animation, hilarious sound effects, exciting action—and best of all, it's shareware. Jun 93

★★★★ **Myst 1.0, Broderbund Software, 415/382-4400, \$59.95.** The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

★★★★ **Seven Days in August, Time Warner Interactive Group, 818/955-9999, \$59.99.** Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961,

(the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

★★★★ **Spectre Supreme, Velocity Development, 415/274-8840, \$69.95 to \$89.95.** The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

★★★ **V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, \$69.95.** The post-D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

## FINANCE/ACCOUNTING

★★★★ **Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, \$79.95.** The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. Apr 94

★★★★ **BestBooks 1.0, Teleware, 201/586-2200, \$99.** In a straightforward, unimimidating manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

★★★ **ExpensePlus 1.0.1, State of the Art, 714/753-1222, \$139.95 to \$159.95.** Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. Apr 94

★★★★ **MacInTax 1993, ChipSoft, 602/295-3110, \$69.95.** Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. Its inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. Apr 94

★★★ **MacInTax Tax Planner, ChipSoft, 602/295-3110, \$19.95.** Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. Apr 94

★★★ **MacInTax Tax Savings Guide, ChipSoft, 602/295-3110, \$19.95.** Simple, straightforward collection of well-written, fully indexed tax tips and suggestions is designed to help you better understand your tax return and reduce your tax liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. Apr 94

★★★★ **Quicken 4, Intuit, 415/858-6095, \$69.95.** Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. Nov 93

## GRAPHICS

★★★★ **addDepth 1.0.2, Ray Dream, 415/960-0768, \$179.** The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

★★★★ **Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, \$595.** The Mac's most dependable draw program has added enough new features to boggle the mind.

It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition. Nov 93

★★★★ **Adobe Photoshop 2.5 (2.51), Adobe Systems, 415/961-4400, \$895.** No graphics program is as universally loved as this one, but while this upgrade builds on the program's capabilities, it ignores some minor weaknesses that have begun to peek through the product's armor. It's still great but perhaps not perfect. Jun 93

★★★★ **Aldus FreeHand 4.0, Aldus Corp., 206/622-5500, \$595.** The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

★★★★ **Alias Sketch 1.5, Alias Research, 416/362-9181, \$995.** The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

★★★ **artWorks 1.0 (1.01), Deneba Software, 305/596-5644, \$149.** If you're expecting a graphics dynamo, this combination paint and draw program will leave you a little cold. Despite its flaws, it ranks as one of the best graphics programs available under \$200. Jun 93

★★★★ **Blueprint 4, Graphsoft, 410/290-5114, \$295.** Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

★★ **BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, \$139.** If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

★★★ **CA-Cricket Draw III 2.0 (2.01), Computer Associates International, 516/342-5224, \$249.** This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward, and the price is right. Oct 93

★★★ **Canvas 3.5, Deneba Software, 305/596-5644, \$399.** Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. Jan 94

★★ **ColorUp 1.0, Pantone, 201/935-5500, \$99.95.** Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

★★★★ **DeBabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, \$299.** Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

★★★ **DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, \$895.** The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

★ **Easy Color Paint 3.0, MECC, 612/569-1500, \$59.95.** For a program that purports simplicity, this color paint program is anything but. Possibly the weakest, least intuitive paint program for the Mac, it's unnecessarily complex and frustrating. Jul 93

★★★★ **Expert Draw 1.0, Expert Software, 305/continues**



# Star Ratings

**567-9990, \$49.95.** Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone on a budget. Aug 93

★★★★ **Folio 1 Media Kit-Print Pro, D'Pix, 614/299-7192, \$499.95.** Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; is free of artifacts; and is crisply focused. Aug 93

★★★★ **Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, \$399.** If you can put up with a few inconveniences, this color paint software provides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. Jul 93

★★★★ **Generic CADD 2.0, Autodesk, 206/487-2233, \$495.** Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

★★★★ **Infini-D 2.5.1, Specular International, 413/253-3100, \$695.** Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operating speed. Feb 94

★★★★★ **Kai's Power Tools 2.0a, HSC Software, 310/392-8441, \$199.** Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate, the ways you can apply them, and the artwork you can create. May 94

★★★★★ **MacroModel, Macromedia, 415/252-2000, \$1495.** This 3-D-modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple, making the Mac's inner space a more pleasant place to work. May 94

★★★★ **Ofoto 2.0 (2.02), Light Source Computer Images, 415/461-8000, \$395.** Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

★★★★ **Paint Alchemy 1.0, Xaos Tools, 415/487-7000, \$99.** For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. May 94

★★★★ **PosterWorks 3.0, S. H. Pierce & Co., 617/338-2222, \$395.** This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. Aug 93

★★★★ **PowerDraw 4.0 (5.0), Engineered Software, 910/299-4843, \$795.** The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

★★★★ **Showplace 2.0, Pixar, 510/236-4000, \$495 to 695.** Adequate, entry-level, 3-D modeler is suitable for illustration and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. Apr 94

★★★★ **StrataVision 3d 2.6.3, Strata, 801/628-5218, \$995.** 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. Feb 94

★★★★ **StudioPro 1.0, Strata, 801/628-5218, \$1495.** If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. Mar 94

★★★★ **Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, \$395.** Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless, but it can be a lifesaver nonetheless. Nov 93

★★★★ **upFront 2.0, Alias Research, 416/362-9181, \$299.** Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. Jan 94

★★★★ **Virtus WalkThrough 1.1, Virtus Corp., 919/467-9700, \$195.** Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. Jul 93

★★★★ **Wraptures One, Wraptures Two, Form and Function, 619/536-9999, \$95 each.** The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

## MATH/SCIENCE

★★★★ **Alchemy III, Tripos Associates, 314/647-1099, \$950.** Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac IIci or better. Sep 93

★★★★ **Amazing Universe 2.1 (2.1a), Hopkins Technology, 612/931-9376, \$79.95.** Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (ProVision II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

★★★★ **Caduceus Science Review Macintosh Project 1.0, Scientia, 617/776-3427, \$150 to \$250.** If you're taking the MCAT, you'd be nuts not to buy this interactive science review. With proper use, its 9MB of files are certain to improve your score. Apr 94

★★★★ **CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, \$199.95.** Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. Aug 93

★★★★ **CSC ChemOffice 2.0, Cambridge Scientific Computing, 617/491-6862, \$995 to \$1595.** Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost \$200,000 and required an equally costly minicomputer. It's a winner. Feb 94

★★★★ **Data Desk 4.0 (4.1), Data Description, 607/257-1000, \$595.** For finding patterns in data, this statistical-analysis program has no peer. Years of refinement have made it a uniquely valuable tool, despite its lack of some tests found in larger programs. May 93

★★★★ **FASTAT 2.0, SYSTAT, 708/864-5670, \$199.** Statistical business-analysis software makes sense as a day-to-day statistics tool. It provides the right tests for most requirements, and its graph types provide plenty of information, although they lack glamour. Jun 93

★★★★ **f(z) 6, Lascaux Graphics, 602/299-0661, \$115.** The main problem this math software attacks is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. Sep 93

★★★★ **InStat 2.01, GraphPad Software, 619/457-3909, \$95.** For scientists with limited statistics backgrounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics will not be a problem. Nov 93

★★★★ **MacPhase 1.2, Otter Solutions, 315/768-3956, \$159.** Low-cost, scientific-data-visualization software with a large assortment of mathematical tools is an authentic bargain. A principal strength is a well-planned color-lookup-table editor that's delightfully easy to use. May 93

★★★★ **MathCAD 3.1, MathSoft, 617/577-1017, \$495.** Numerical and symbolic computation software is easy to learn and use, and is much more powerful than earlier versions. It does not compete in scope with the largest mathematics programs, but for most science and engineering tasks, it's a fast way to get problems solved. Jun 93

★★★★ **Mathematica 2.2, Wolfram Research, 217/398-0700, \$595.** The one essential program in science and mathematics adds a function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. Sep 93

★★★★ **QC Tools 1.0, Abacus Concepts, 510/540-1949, \$245.** Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is generally well designed, well documented, and suitable for quality-control neophytes as well as professionals. Jan 94

★★★★ **Spyglass Dicer 2.0, Spyglass, 217/355-6000, \$695.** Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. Jul 93

★★★★ **Spyglass Transform 3.0 (3.01), Spyglass, 217/355-6000, \$595.** Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. Sep 93

★★★★ **StatView 4.01 (4.02), Abacus Concepts, 510/540-1949, \$595.** If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. Oct 93

★★★★ **Sum Total 1.01, Concurrent Engineering Tools, 602/464-8208, \$99.95.** Exceptional calculator utility is packed with advanced features, including a mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach causes a distinct time-lag in menu operations. Oct 93

★★★★ **Theorist 1.5, Prescience Corp., 415/543-2252, \$289.95.** Symbolic-math program that you can figure out by yourself adds a useful table feature, more special functions of physics, and better graphics. It's still the only program to use real notation directly. May 93

★★★★ **Turing's World 3.0, CSLI Publications, 312/568-1550, \$19.95.** Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. Feb 94

★★★★ **Visualization of Natural Phenomena, Telos/Springer Verlag, 408/249-9314, \$59.95.** CD-ROM introduction to applying all aspects of computer



graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. Jan 94

★★★★★ **Voyager II 1.0 (1.01), Carina Software, 510/352-7328, \$159.95.** If a brilliantly lit, star-filled sky holds more than a moment's fascination for you, you need to know about this astronomy program. In a firmament of mostly faint and forgettable astronomy software, it's a supernova. Jul 93

## ORGANIZATION/PRODUCTIVITY

★★★ **Achieving Your Career 1.02 (1.04), Up Software, 415/921-4691, \$69.** HyperCard-based job-search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. Aug 93

★★★★ **Arrange 1.1, Common Knowledge, 415/325-9900, \$349.** This personal information database's flexible, intuitive approach to data-handling makes it an excellent tool for storing all kinds of day-to-day information. May 94

★★★★ **CalendarMaker 4.0, CE Software, 515/224-1995, \$59.95.** Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

★★ **ClientTrac 1.7.1 (1.7.2), Whiskey Hill Software, 415/851-8702, \$135.** Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

★★★ **Contact Ease 2.0.1 (2.0.2), WestWare, 619/274-5053, \$395 to \$1495.** Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks but is overall a good program. Aug 93

★★★★ **DateBook and TouchBase Pro Bundle, Aldus Corp. Consumer Division, 619/558-6000, \$149.95.** Calendar and contact manager offer a superior combination of integration, usefulness, and features. If you want to get organized, make sure you look at this dynamic duo. Feb 94

★★★★ **In Control 2.0, Attain Corp., 617/776-1110, \$89.95.** The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. Aug 93

★★★ **Now Contact 1.0, Now Software, 503/274-2800, \$99.** This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. Mar 94

★★★★ **Now Up-to-Date 2.0, Now Software, 503/274-2800, \$69.95 to \$599.** Calendar utility combines flexibility, ease-of-use, and streamlined operations in an almost irresistible package. The Reminder control panel, although it is a great new feature, has had minor conflicts. Jun 93

★★★★ **Power Team 1.0, ProVue Development Corp., 714/892-8199, \$149.95.** Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. Oct 93

★★ **Rae Assist 1.0.2, Rae Technology, 408/725-2850, \$199.** Although this personal-information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. Jan 94

## PRESENTATION TOOLS

★★★★★ **Adobe Premiere 3.0, Adobe Systems, 415/961-4400, \$695.** Solid and dependable QuickTime video-editing software offers a structured, responsive, and flexible interface with enhancements that range from the mundane to the dramatic. It can now mix 99 tracks. Jan 94

★★★★ **Astound 1.0, Gold Disk, 408/982-0200, \$399.** Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart in other products. It's a good value. Nov 93

★★★★ **Authorware Professional 2.0.1, Macromedia, 415/252-2000, \$4995.** Multimedia-scripting and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. Feb 94

★★★ **Avid VideoShop 2.0, Avid Technology, 508/640-6789, \$499.** QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for hard-core video professionals. Feb 94

★★★★ **CoSA After Effects 1.1, CoSA, 401/831-2672, \$1295.** QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It produces results that simply can't be created in other packages. Oct 93

★★ **Elastic Reality 1.0, ASDG, 608/273-6585, \$349.** Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate tech support make that a difficult task. Feb 94

★★★ **Hi Rez Audio Volume 1.0, Presto Studios, 619/689-4895, \$149.95.** The enjoyable, high-quality music on this CD-ROM adds a nice touch to presentations. The software for browsing the music is quirky, and the product could use some documentation. Jul 93

★★★ **Interactive Training for Director 1.1, Media In Motion, 415/621-0707, \$199.** This somewhat expensive program teaches basic Macromedia Director skills and provides a foundation for exploring Director's other features. It has a clear, often lighthearted approach, but navigating the lessons can be frustrating. Jun 93

★★★★ **Morph 2.0, Gryphon Software, 619/454-6836, \$239.** Easy to use morphing software is beautifully designed, with delightful new features, including the ability to morph QuickTime movies. Using it is as painless as morphing gets. Apr 94

★★ **MovieWorks 1.1 (2.0), Interactive Solutions, 415/377-0136, \$395.** Over 100 bugs were fixed in version 1.1 of this multimedia authoring software that takes an all-in-one approach to creating presentations, but problems remain. It's a good idea, poorly executed. Jun 93

★★★ **Passport Producer Pro 1.0, Passport Designs, 415/726-0280, \$995.** Superb, albeit quite expensive, media-integration package makes assembling even complex presentations surprisingly easy. Path animation is limited to entrances and exits. Apr 94

★★★ **QuickFlix 1.0, VideoFusion, 419/891-1090, \$149.** Approachable QuickTime moviemaking software lacks the high-end features of other programs but costs a whole lot less. Feb 94

★★★ **VideoFusion 1.0.1 (1.5), VideoFusion, 419/891-1090, \$649.** Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos, then go ahead and indulge. Jul 93

★★★★ **Working Model 1.0, Knowledge Revolution, 415/553-8153, \$995.** Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. Oct 93

## PROGRAMMING

★★★ **CLimate 1.0, Orchard Software, 617/876-4608, \$59.95.** With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irresistible package. Oct 93

★★★★ **FutureBASIC 1.0 (1.02), Zedcor, 602/881-8101, \$299.95.** Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. Jul 93

★★★ **Macintosh Common Lisp 2.0 (2.0.1), APDA, 716/871-6555, \$495.** Anyone who likes programming in LISP will be pleased with the environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. Oct 93

★★★ **Object Logo Student Edition, Paradigm Software, 617/576-7675, \$49.95.** This book-plus-disk package offers a wide-ranging introduction to programming concepts. It's aimed roughly at the high-school educational level and lets you see something happen for every few lines of code you type. Jul 93

★★★★ **Object Master for Think C and C++, ACI US, 408/252-4444, \$255.** Object-oriented development environment is full of goodies and will pay for itself in about a week due to increased programmer productivity. Apr 94

★★★★ **PG:Pro 1.5 (2.1), Staz Software, 601/255-7085, \$169.** For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. Jul 93

★★★ **PowerPacks 2.0, NDG Phoenix, 301/718-8880, \$225.** Programmers' tool kit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-blistering performance in most areas, though. Oct 93

★★★★ **Smalltalk/V for Macintosh 2.0, Digitalk, 714/513-3000, \$495.** Object-oriented development system is now even more viable for commercial projects. The customer support and documentation set a standard other vendors should emulate. Feb 94

★★★ **SoftPolish 1.1, Language Systems Corp., 703/478-0181, \$295.** Program-quality-assurance utility systematically checks the resources in a program's interface against a huge laundry list of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. Sep 93

★★★ **SourceSafe 2.1, One Tree Software, 919/821-2300, \$295 to \$1195.** Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. Sep 93

★★★★ **Symantec C++ for Macintosh 6.0, Symantec Corp., 408/253-9600, \$499.** If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. Nov 93

★★★★ **VIP-C 1.0.1, Mainstay, 805/484-9400, \$495.** If you've mastered the rudiments of C, this continues



# Star Ratings

programming-code generator will let you code about ten times faster than you could using only an editor. Its real strength is in rapidly assembling smaller projects. **May 94**

## UTILITIES

★★★★ **7th Heaven 2.5 (2.5.1), Logical Solutions, 612/659-2495, \$99.95.** Our reviewer found the seven enhancements to System 7 fun and elegantly done, but not all of them were useful. **Jul 93**

★★★★ **Alki Seek 2.1, Alki Software Corp., 206/286-2600, \$39.95.** Competent file-finding utility scans by file name or content and lets you combine multiple search criteria. It cannot search in the background or find text in compressed files. **Jul 93**

★★★★ **AppleSearch 1.0, Apple Computer, 408/996-1010, \$1799.** Although it has some rough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts text from documents in many formats. **May 94**

★★★★ **Atticus Vista 1.0, Atticus Software Corp., 203/348-6100, \$69.95.** Control panel and application automatically catalog the disks you mount on the desktop. It has a few problems, including limited search options, but it can help bring order to disorganized disk collections. **May 94**

★★★★ **Billy Steinberg's PBTools 1.0.1, Inline Software, 203/435-4995, \$99.55.** If you want basic PowerBook management without added frills or complex menu bar displays, this collection of four utilities may be just your cup of tea. **Jul 93**

★★★★ **CD-ROM ToolKit 1.0.5, FWB, 415/474-8055, \$79.** Software accelerator can halve the time it takes to open files and search on a CD-ROM. The product supports a wide variety of formats and CD-ROM drives, but users should be aware that playback of QuickTime movies is often uneven. **May 94**

★★★★ **Chameleon 2.0.3 (2.1), Logical Solutions, 612/659-2495, \$59.95.** Sleek desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. **Sep 93**

★★★★ **ClickChange 2.0, DUBL-Click Software, 818/888-2068, \$89.95.** Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac's look and feel. **Aug 93**

★★★★ **Connectix Desktop Utilities 1.0 (1.0.1), Connectix Corp., 415/571-5100, \$99.** Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It's worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. **Nov 93**

★★★★ **CopyDoubler 2.0 (2.0.1), Symantec/Fifth Generation Systems, 504/291-7221, \$59.** This utility speeds up copying, lets you queue jobs for background copying, and offers other useful copying-oriented features—all at a very reasonable price. **Nov 93**

★★★★ **Copyright Pro 1.0.3, CSG Technologies, 412/471-7170, \$79.** Utility takes over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. It doesn't speed up copying, however. **Nov 93**

★★★★ **CPU 2.0 (2.0.1), Connectix Corp., 415/571-5100, \$99.** Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. **Sep 93**

★★★★ **CryptoMatic 1.0.1, Kent Marsh, 713/522-5625, \$99.** Security software offers fast Finder-level encryption and decryption with effective file removal.

Although its simplest encryption algorithm isn't quite hacker-proof, it's worth considering. **Feb 94**

★★★★ **DiskLock PB 1.0, Symantec/Fifth Generation Systems, 504/291-7221, \$59.** PowerBook security software balances robust security with simplicity and ease of use. It's much harder to crack than most PowerBook utility collections' security features, and will keep out all but the most determined. **Jan 94**

★★★★ **The Disney Collection Screen Saver, Berkeley Systems, 510/540-5535, \$49.95.** Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. **Mar 94**

★★★★ **DriveShare 1.03, Casa Blanca Works, 415/461-2227, \$129.95.** This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. **Nov 93**

★ **DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, \$59.95.** Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a \$60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for \$10, that makes it a bad deal. **Jan 94**

★★★★ **DupLocator 1.03, Midnight Software, 303/933-1013, \$99.** For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. **Jan 94**

★★★★ **Dynopage 2.0, Portfolio Software, 802/865-2700, \$59.95.** While this utility simplifies the printing of booklets and double-sided pages, it doesn't support PostScript graphics, is incompatible with some popular applications, and has a buggy drag-and-drop feature. **Jul 93**

★ **eDisk 1.0 (1.2), Alys Software Corp., 415/566-2263, \$149.95.** Driver-level compression software has little to recommend it over file-level, idle-time compression programs. The biggest drawback is the strong potential for disk or file corruption. **Oct 93**

★★★★ **Freedom of Press Classic, ColorAge, 508/667-8585, \$149.** Utility allows you to print PostScript graphics on almost any non-PostScript printer—easily and with impressive results. **Mar 94**

★★★★ **Icon 7, Inline Software, 203/435-4995, \$79.95.** Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. **Sep 93**

★★★★ **Icon-It Pro 3.0.6, Olduvai Corp., 305/670-1112, \$129.** Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. **Dec 93**

★★★★ **I Like Icon 1.0, Baseline Publishing, 901/682-9676, \$59.95.** Glitzy utility has tools for icon editing, has a nice library of icons, and can create animated icons. Some basic features, such as a text tool, are missing, and the animated icons are fun but impractical. **Sep 93**

★★★★ **KidDesk 1.0 (1.1), Edmark Corp., 206/556-8484, \$39.95.** If you have young children who love to experiment with your Mac, this desktop environment provides easily navigable play while protecting your files from the havoc that little fingers can wreak. **Jun 93**

★★★★ **MacPak 1.0, Symantec/Fifth Generation Systems, 504/291-7221, \$149.** The quality of this utility collection is uneven—some modules are unpolished—but if you don't already own AutoDoubler, CopyDoubler, and a good file-management program, it's worth the price. **Jan 94**

★★★★ **MacTools 3.0, Central Point Software,**

**503/690-8090, \$149.** Recovering trashed files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. **Mar 94**

★★★★ **Magic Typist 2.0, Olduvai Corp., 305/670-1112, \$129.** If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. **Sep 93**

★★★★ **Mr. File 2.0, Softways, 408/978-9167, \$99.** The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. **Dec 93**

★★★★ **Now Compress 1.0 (1.0.1), Now Software, 503/274-2800, \$99.** Compression utility holds its own in a crowded market; it's easy to use, it's complete, and it compresses as well as or better than other options. **Dec 93**

★★★★ **Now Fun, Now Software, 503/274-2800, \$69.** Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. **Dec 93**

★★★★ **Now Utilities 4.0.1 (4.0.1p), Now Software, 503/274-2800, \$129.** Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. **Aug 93**

★★★★ **Open Sesame 1.02, Charles River Analytics, 617/491-3474, \$99.** Utility automates Finder operations, such as opening and closing files, without resorting to macros or scripts. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. **May 94**

★★★★ **OptiMem 1.4.1, Jump Development Group, 412/681-2692, \$129.** Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Works best with software that handles minimum-memory situations effectively. **Mar 94**

★★★★ **Peace of Mind 1.2.2 (1.3.3), DiagSoft, 408/438-8247, \$149.** Hardware diagnostic tool performs exhaustive tests on major Mac hardware components; does an excellent job of diagnosing simple simulated hardware errors. The program has minor bugs and lacks a comparative test-history feature. **Jun 93**

★★★★ **Power To Go 2.0, Claris Corp., 408/727-8227, \$99.** PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. **Dec 93**

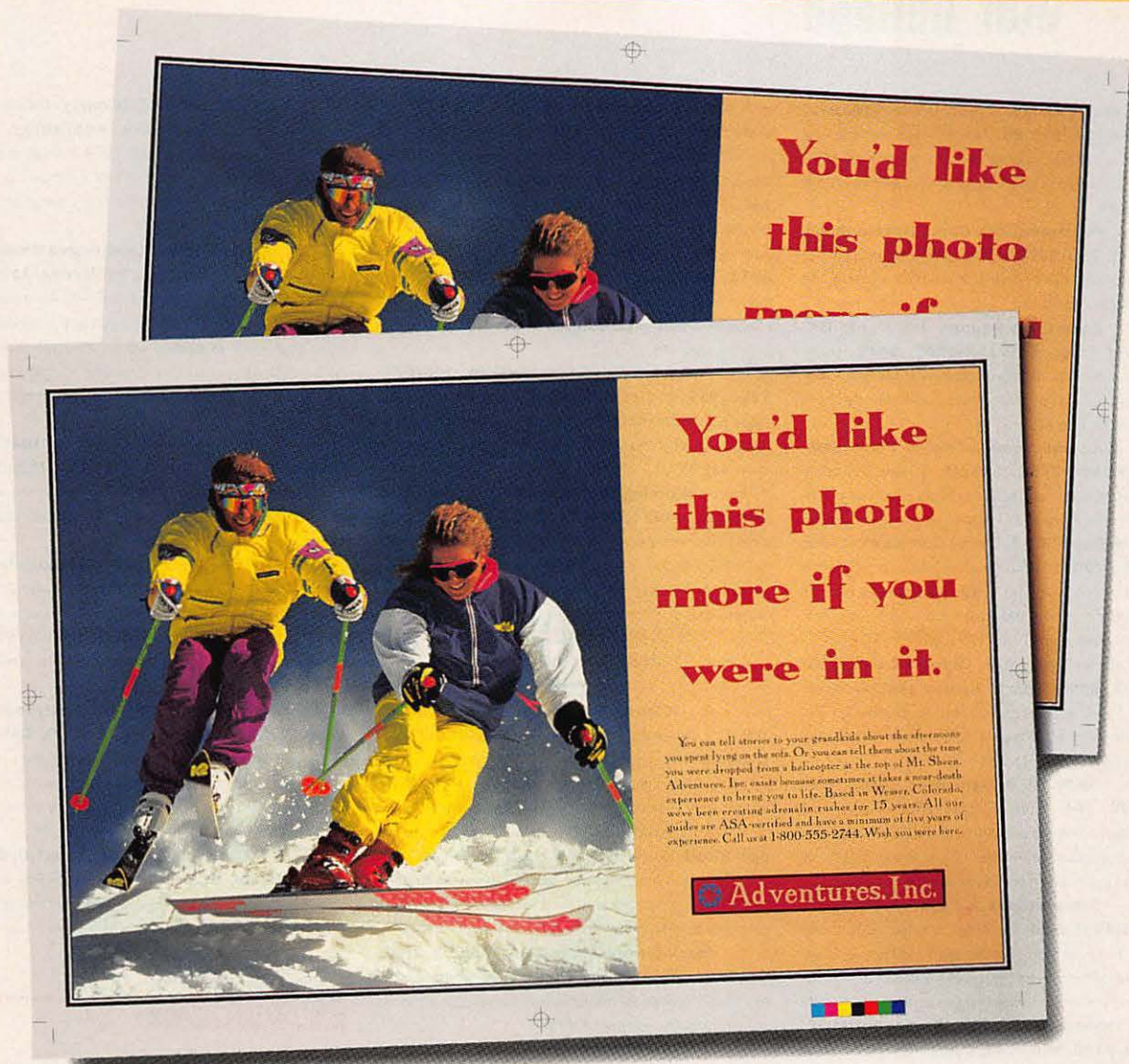
★★★★ **Public Utilities for the Macintosh 1.0, Symantec/Fifth Generation Systems, 504/291-7221, \$149.** Utility sticks to the basics of disk diagnosis, disk repair, and file optimization. It does a good, and sometimes unique, job, but disk optimization is slow. **Jun 93**

★★★★ **QuickKeys 3.0, CE Software, 515/221-1801, \$169.** The simple, unimposing interface of this macro-building utility allows you to build a set of useful shortcuts quickly. **Mar 94**

★★★★ **RAM Doubler 1.0.1, Connectix Corp., 415/571-5100, \$99.** Inexpensive system extension doubles available RAM for many Macintosh users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. **May 94**

*continues*





*One of these is a color proof and one is output from our new printer. We forgot which is which.*

We paid \$70 and waited three days for one of these. The other popped out of our new Tektronix Phaser™ 480 in minutes. Pull out your loupe and start guessing. And while you're down there staring, note our output's phenomenal color. PANTONE®-approved, it's perfect for matching those tricky product colors, logos and skin tones. You might also notice the full 11" x 17" print area. Yes, Virginia, there are tabloid-sized full bleeds. And it shares easily: the Phaser 480 is a work group printer for Macs,

PCs or workstations. Plus, it boasts a powerful RISC processor and true Adobe® PostScript™ Level 2. Spread-sized bleeds? Reprint quality comps? Pre-film proofing right at your desk? Welcome to reproduction heaven. So head down to your nearest Tektronix dealer to see for yourself. And by the way, our guess is that the one on the bottom is our print. Well, then again ...



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# Star Ratings

★★★ **Redux Deluxe 2.0.2**, Inline Software, 203/435-4995, \$79.95. Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. Jan 94

★★★★ **Retrospect 2.0**, Dantz Development Corp., 510/253-3000, \$249. Powerful backup and archiving software has an improved interface and scripting capabilities, and works well for all levels of users. Sep 93

★★★★ **Retrospect Remote 2.0**, Dantz Development Corp., 510/253-3000, \$449. Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. Sep 93

★★★ **Safe and Sound**, Central Point Software, 503/690-8090, \$49.95. Limited but useful disk-protection and -salvage utility has a clean, simple interface and is an efficient emergency recovery tool. Jun 93

★★ **SafeDeposit 1.2**, Dayna Communications, 801/269-7200, \$189. Automated backup program is easy to set up but slow. Also, unattended backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. Sep 93

★★ **Safe or Sorry 1.0**, Olduvai Corp., 305/670-1112, \$59. Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

★★★★ **SAM 3.5.8**, Symantec Corp., 408/253-9600, \$99. Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

★★★★ **Screenscapes 1.0.1**, Kiwi Software, 805/685-4031, \$44.95. With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93

★★★ **Square One 1.5.2**, Binary Software, 310/582-8293, \$74. Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. Aug 93

★★ **Stacker for the Macintosh 1.0.1**, Stac, the Data Compression Company, 619/431-7474, \$149. As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93

★★★★ **Star Wars Visual Clips**, Sound Source Unlimited, 805/494-9996, \$89.95. Control panel lets you play QuickTime movie clips from *Star Wars* at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will make you remember why you love your Mac. Sep 93

★★★ **Tempo II Plus 3.0.9**, Affinity Microsystems, 303/442-4840, \$179.95. Very capable macro-creating utility may be daunting for novices but offers plenty of power for advanced users. Mar 94

★★★★ **TimesTwo 2.0**, Golden Triangle Computers, 619/587-0110, \$149. This driver-level compression utility is transparent and robust. It caused no problems through a two-month course of testing, on a system with myriad utilities and system software tools. Mar 94

★★★★ **Toner Tuner 1.0.3**, Working Software, 408/423-5696, \$24.95. Inexpensive, incredibly useful extension adds a sliding bar to print dialog boxes allowing you to adjust the amount of toner applied to each print job. If you can't save trees, you can at least save toner. Dec 93

★★★★ **ultraShield 1.252 (1.3)**, usrEZ Software, 714/756-5140, \$149. Sophisticated security product combines practically every feature you might need into an integrated package, including a lightning-fast version of the U.S. government data-encryption standard. Dec 93

★★★★ **Virex 5.0**, Datawatch Corp., 919/549-0711, \$99.95. The extremely fast, trouble-free performance of this software makes the task of guarding against computer viruses almost painless. Its speed puts it ahead of the pack. May 94

★★★ **Virtual 3.0.1**, Connectix Corp., 415/571-5100, \$99. If you need to eke out as much virtual memory speed as possible, this utility may be a useful tool. For System 6 users who want virtual memory, it's the only game in town. Sep 93

★★★ **Working Watermarker 1.02**, Working Software, 408/423-5696, \$49.95. Simple, useful system extension allows you to print or fax text and/or graphics "watermarks" in the background of virtually any document. Although it has imperfections, it's earned a permanent spot in our reviewer's System Folder. Jan 94

## VERTICAL MARKET

★★★★ **Claire, The Personal Music Coach 1.0.1**, Opcode Systems, 415/856-3333, \$129.95. Musicianship program teaches pitch and interval recognition, sight singing, and intonation. Although the interface is nonstandard, it's logical and easy to learn. May 94

★★★★ **Finale 3.0.1**, Coda Music Technology, 800/843-2066, \$749. Upgraded music-notation software is now infinitely more pleasant to use. Its comprehensive feature set makes it the standard against which all other music-notation products must be judged. Dec 93

★★ **MacInteriors**, Microspot, 408/253-2000, \$129. Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

★★★★ **Musicshop 1.0**, Opcode Systems, 415/856-3333, \$149.95. MIDI sequencer is an excellent choice as a first sequencer. It's powerful enough to satisfy the needs of most MIDI users. Oct 93

★★★ **Roll Call 2.0 (2.5.6 or 3.0)**, By the Numbers, 603/927-4508, \$495 to \$595. 4th Dimension database application for church management helps track donations, attendance, church-group membership, and visitation. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

★★★ **Sailing Master 1.1**, Starboard Software, 313/662-4393, \$64.99. Though the slow speed and jerky motion point to less-than-polished programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

## WRITING TOOLS

★★★★ **MacWrite Pro 1.5**, Claris Corp., 408/727-8227, \$249. The clean, uncluttered interface of this low- to middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. May 94

★★★ **MasterWord 5.1**, Alki Software Corp., 206/286-2600, \$99.95. The centerpiece of this package of add-on Microsoft Word commands is a set of customizable tool bars. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

★ **The Oxford English Dictionary**, Oxford University Press, Electronic Publishing, 212/679-7300 ext.7370, \$895. CD-ROM dictionary contains 20 print volumes, including half a million words, but the flaws, omissions, unreliability and unforgivably poor design are unbearable. Apr 94

★★★★ **Random House Unabridged Dictionary**, Random House Electronic Publishing, 212/572-2600, \$179. The most comprehensive American-made dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. May 94

★★★★ **Spelling Coach Professional 4.0.1**, Deneba Software, 305/596-5644, \$195. If you're considering investing in reference software, this spelling checker, dictionary, and thesaurus is a relatively capable, if expensive, alternative. Oct 93

★★★★ **Thunder 7 1.5.3**, Baseline Publishing, 901/682-9676, \$99.95. Stand-alone spelling checker and thesaurus interactively monitors your keystrokes and alerts you to potential errors as they are entered. It quickly and transparently prevents you from making embarrassing typos. Nov 93

★★★★ **WordPerfect for Macintosh 3.0**, WordPerfect Corp., 801/225-5000, \$495. The innovative interface of this word processor uses context-sensitive button bars and expandable rulers to make innumerable features accessible with a click of the mouse. It's an accomplishment in ease of use. Mar 94

★★★ **A Zillion Kajillion Rhymes 1.0**, Eccentric Software, 206/628-2687, \$49.95. Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores -ed, -s, and -ing endings). Nov 93

## Hardware

### MISCELLANEOUS HARDWARE

★★ **ACS100**, Altec Lansing Consumer Products, 717/296-2818, \$180. Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

★★ **ACS150**, Altec Lansing Consumer Products, 717/296-2818, \$150. Subwoofer rounds out the sharp tones of the ACS100, but the bass response is neither punchy enough nor loud enough, and the unit is about the size and weight of a concrete block. Dec 93

★★ **Address Express**, CoStar Corp., 203/661-9700, \$499. Flaky performance and system crashes plagued this envelope-and-label printer in our tests, but the print quality was good. Oct 93

★★ **Apple Adjustable Keyboard**, Apple Computer, 408/996-1010, \$219. Keyboard is only a slight improvement on the flat slab keyboard. Theoretically, it corrects ulnar deviation, but many sufferers of repetitive stress injuries want a keyboard that adjusts vertically. Jul 93

★★★★ **AppleCD 300**, Apple Computer, 408/996-1010, \$599. Double-speed CD-ROM drive spins its discs at twice the speed of earlier drives, providing faster access to large files. Jun 93

★★★★ **Apple Color OneScanner**, Apple Computer, 408/996-1010, \$1349. Tests of this color scanner demonstrate unpolluted colors and sharp image continues



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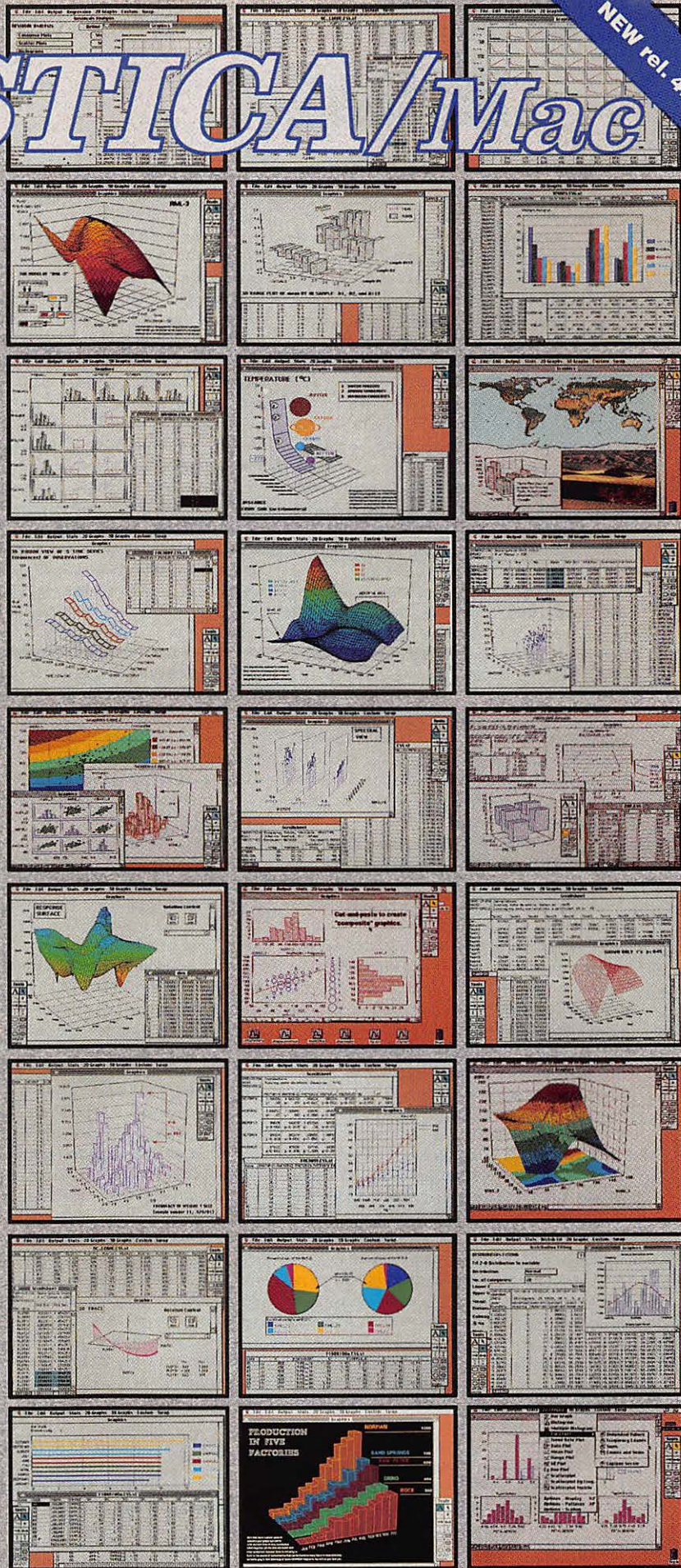
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Circle 99 on reader service card





# Star Ratings

details, perhaps due to color filters and lenses that Apple claims were designed and tuned for the scanner. Jul 93

★★★ **AppleDesign Powered Speakers, Apple Computer, 408/996-1010, \$179.** Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

★★★ **Apple Newton MessagePad, Apple Computer, 408/996-1010, \$699.** Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. Dec 93

★★★ **Apple PowerCD, Apple Computer, 408/996-1010, \$400.** This extremely versatile and beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. Jan 94

★★★★ **ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, \$449.** Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics programs. Aug 93

★★★ **Computer Crayon, Appoint, 510/463-3003, \$49.** The kid contingent's verdict was a definite thumbs-up on this brightly colored input device that's shaped like a thick pencil. The buttons can be hard for smaller children to press, and serious computer artists should still opt for a drawing tablet. Oct 93

★★★★ **Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, \$2600.** Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newsprint publications and some catalogs. Dec 93

★★★★ **Cypress PhonePro 1.2, Cypress Research Corp., 408/752-2700, \$349 to \$950.** By improving its integration with FaxPro and with PowerTalk and PowerShare, this powerful telephony software has greatly extended its business scope. May 94

★★★ **EMBARC, Embarc Communications Services, 407/364-2000, \$395 plus fees.** If you're a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. Sep 93

★★★★ **Epson ES-800C, Epson America, 310/782-0770, \$1499; Macintosh interface kit \$399.** Flexible 400-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package. Aug 93

★★ **Gulliver, Appoint, 510/463-3003, \$119.** This diminutive mouse is hard to hold comfortably for an extended period, but it works well on almost any surface and is an acceptable option for PowerBook users. Oct 93

★★ **G-Vox, Lyrrus, 215/922-0880, \$399.** Hardware-software guitar-instruction package lets your Mac "hear" the notes you play on your guitar. Although the hardware works well, the software has some basic problems and doesn't live up to the hardware. Apr 94

★★★★ **Hello Music, Yamaha Corp. of America, 714/522-9240, \$449.** MIDI starter kit includes an impressive tone generator that's compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. Dec 93

★★★★ **LightningScan Portable, Thunderware, 510/254-6581, \$459.** PowerBook owners will find this hand scanner's modem- or serial-port connection, lightweight

interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. Dec 93

★★★ **Macintosh TV, Apple Computer, 408/996-1010, \$2079.** As a computer, this combination computer-television-CD player is sleek but slow. You can get faster performance and better expandability from several less-expensive Performa models. Apr 94

★★★★ **Mirror 800 Plus Color Scanner, Mirror Technologies, 612/633-4450, \$1299.** Add the NuBus JPEG board (\$300) and easy-to-use 35mm transparency scanning module (\$599) and to get a nifty—if slow—desktop scanning package for a reasonable price. Jan 94

★★★ **PenDirect ADB, FTG Data Systems, 714/995-3900, \$498.** Input device lets you manipulate items on the Macintosh screen using a special stylus called a light pen. It works well, although it seems ergonomically inferior to a mouse for routine tasks. Mar 94

★★★ **PowerLink Presenter, E-Machines, 503/646-6699, \$499.** Simple, compact Duo dock wobbles a bit when plugged in but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. Nov 93

★★★ **PowerPlate, Technögg, 513/321-1777, \$169.95 to \$299.95.** Line of long-lived, external PowerBook battery packs, each of which lets you work for three to five times as long as the usual PowerBook battery. Unfortunately, the System 7 power manager periodically alerts you that your battery is not charging and dims the screen though battery pack has hours of time left. Mar 94

★★★ **RCD-202, Pinnacle Micro, 714/727-3300, \$3995.** Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. Mar 94

★★★ **ScanMaker 35t, Microtek, 213/321-2121, \$1999.** Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is weak. Dec 93

★★★ **ScanPlus Color 6000 for Mac, PlusTek USA, 408/980-1234, \$749.** Small, inexpensive sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, economical option. Sep 93

★★★★ **ThinPack, VST Power Systems, 508/287-4600, \$199.95.** External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. Mar 94

★★★ **TrakMate, Key Tronic Corp., 509/928-8000, \$149.** Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. Feb 94

★★★ **Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, \$749.** Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. May 94

★★★★ **Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9240, \$149.95.** Powered speakers have a good balanced sound and a great volume range at an outstanding price. Apr 94

## MODEMS/NETWORK HARDWARE

★★★★ **AsantéHub 1012, Asanté Technologies, 408/435-8388, \$1299.** This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. Dec 93

★★★★ **DataLink PB; Accell Cellular Interface, Applied Engineering, 214/241-6060, \$824.** If you need a full-blown office on the beach, this PowerBook cel-

lular-modem package with automatic answering machine is a well-executed solution. Each recorded second requires 25K of disk space. Nov 93

★★★★★ **EtherWave, Farallon Computing, 510/814-5000, \$129.** If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. Instead of providing only one 10BaseT twisted-pair jack, it includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. May 94

★★★ **PerFit Port-A-Com, PerFit, 303/530-7333, \$349.** Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. Nov 93

★★★ **SupraFaxModem 144PB, Supra Corp., 503/967-2400, \$349.95.** If you're looking for a high-speed internal modem for your PowerBook, and you want to save a few bucks, this modem is worth considering. Disabling its fax software solved occasional transfer problems. Nov 93

## PRINTERS

★★★ **Apple Color Printer, Apple Computer, 408/996-1010, \$2349.** If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. Aug 93

★★★★ **Apple Portable StyleWriter, Apple Computer, 408/996-1010, \$439.** Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. Jan 94

★★ **Brother HJ-400, Brother International, 908/356-8880, \$369.** Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. Some large files require additional application memory to print correctly. May 94

★★★★ **DeskWriter 310, Hewlett-Packard, 800/752-0900, \$379 to \$455.** Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it's also a great desktop printer; and with a \$49 color print cartridge, it offers inexpensive three-color printing. Mar 94


★★★ **HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, \$1279.** Primarily for those of you who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. Its advanced PC features may not be worthwhile for those who use Macs only. May 94

★★★ **LaserWriter Pro 600 and 630, Apple Computer, 408/996-1010, \$2099 to \$2529.** From their paper handling to their print quality, these laser printers are Apple's best. Unfortunately, they don't support emulation-sensing, and thus may be less desirable for mixed-platform offices than other possibilities. Jun 93

★★★★ **LaserWriter Select 300, Apple Computer, 408/996-1010, \$839.** Inexpensive, low-capacity printer is networkable, and an excellent value, in spite of a few weaknesses. Add a 4MB SIMM to take advantage of the printer's amazing PhotoGrade capabilities, which enable the printer to generate 91 shades of gray. Aug 93

★★ **LaserWriter Select 310, Apple Computer, 408/996-1010, \$1099.** This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communi-  
*continues*





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# Star Ratings

cations Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides. **Aug 93**

★★★★★ **LaserWriter Select 360, Apple Computer, 408/996-1010, \$1599.** Low-cost, high-performance, 10 ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer. **Apr 94**

★★★ **MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, \$999.** Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. **Dec 93**

★★★★★ **Personal LaserWriter 320, Apple Computer, 408/996-1010, \$959.** If you've been holding out for a high-quality personal laser printer that's fast enough to share over LocalTalk, the small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. **May 94**

★★★ **Phaser 200i Color Printer, Tektronix, 503/682-7377, \$5995.** This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopier bond. **Aug 93**

★★★ **PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, \$2450.** While this multiplatform printer is fast and prints clearly, many Mac users will find it frustrating as it can't print some TrueType fonts. **Jul 93**

★★★ **Smart Label Printer Pro, Seiko Instruments, 408/922-5900, \$299.95.** If you need to print only a few labels at a time, this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. **May 94**

★★★★★ **StyleWriter II, Apple Computer, 408/996-1010, \$359.** Apple's ink-jet printer retains the best features of its predecessor, but costs less. New features, such as gray-scale printing and the ability to share the printer over a network, make it even more versatile. **Jun 93**

## SYSTEMS/STORAGE

★★★★ **Centris 610, Apple Computer, 408/996-1010, 4/80 \$1859.** Slim-design Mac uses a 20MHz 68LC040 processor at a price-to-performance ratio that comes close to competing with Windows PCs; however, its expandability is severely limited. **Jun 93**

★★★★★ **Centris 650, Apple Computer, 408/996-1010, 4/80 68LC040 \$2699.** Moderately priced but fast 040 system offers three expansion slots and one drive bay, and (except for the base model) has built-in Ethernet, video circuitry, and a math coprocessor. **Jun 93**

★★★★★ **DataPak 105, Mass Microsystems, 408/522-1200, \$949 to \$1049.** Well-built 105MB SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. **Sep 93**

★★★ **EtherDock, E-Machines, 408/541-6100, \$699.** Heavy-duty Duo docking option is equipped with a full set of 11 ports, including an Ethernet port. The locking mechanism is alarmingly wobbly—although reliable enough to ensure a good connection. **May 94**

★★★ **Expert Pad PI-7000, Sharp Electronics Corp., 800/993-9737, \$899.** Personal digital assistant features the advantages of the Newton, in a better industrial design and at a comparative price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. **Feb 94**

★★ **HP Optical Disk Library 10LC, Hewlett-**

**Packard, 800/752-0900, \$9495.** Optical jukebox may fill the need for 10 gigabytes of online storage, but its performance is poor, and the software lacks the features needed for adequate management. **Jan 94**

★★★★ **Infinity 105 Turbo, Peripheral Land, 510/657-2211, \$795 to \$894.** Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. **Sep 93**

★★★ **Infinity Optical 3.5, Peripheral Land, 510/657-2211, \$1999.** If you need the extra measure of permanence that magneto-optical storage provides—or a compact alternative to bulky cartridges—this drive, based on a Sony mechanism and using 3½-inch disks that store 120MB of data, deserves a look. **Jun 93**

★★★★ **LC III, Apple Computer, 408/996-1010, 4/80 \$1349.** Base system comes equipped with a 25MHz 68030 processor and 512K of VRAM. This is a machine that fits the bill and the pocketbook of most home users and small-business owners. **Jul 93**

★★★ **MicroMac Plus Upgrade System, MicroMac, 714/362-1000, \$499.** This 68030 accelerator for the Mac Plus requires disassembling a Plus and using the Plus system board to assemble the MicroMac system. It speeds up the Plus dramatically, and supports an included external full-page monochrome monitor. **Jun 93**

★★★★ **MultiDisk 150, Iomega, 801/778-1000, \$699.** Durable cartridges are one of the strongest reasons to choose this Bernoulli removable drive. Although it's slightly more expensive than a SyQuest drive, it's fast and reliable, and the disks are competitively priced. **Jun 93**

★ **NuTek Duet, NuTek USA Corp., 408/973-8799, \$2996.** Mac workalike is both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duet is not a computer anyone should consider using for serious work. **Feb 94**

★★★★ **OrangePC, Orange Micro, 714/779-2772, \$1799.** NuBus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. **Oct 93**

★★★★ **PLI 2.4 GB MiniArray, PLI, 510/657-2211, \$4815.** Slick and elegant RAID drive worked beautifully in tests, but it costs more than other options and the QuickSCSI board is sensitive to minor SCSI problems. **Apr 94**

★★★★★ **PowerBook 140 F/25 Upgrade, Digital Eclipse Software, 510/547-6101, \$399.** By changing the oscillators and adding an FPU, Digital Eclipse changes a PowerBook 140 into a 170, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. **Dec 93**

★★ **PowerBook 165c, Apple Computer, 408/996-1010, 4/80 \$3399.** The passive matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant work environment. **Jul 93**

★★ **PowerBook 180c, Apple Computer, 408/996-1010, 4/80 \$4169.** The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. **Sep 93**

★★★★★ **PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 \$3099.** Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. **Feb 94**

★★★★★ **Quadra 605, Apple Computer, 408/996-1010, 4/80 \$979.** Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match

those of a standard entry-level 486SX-based Windows PC. **Mar 94**

★★★★★ **Quadra 800, Apple Computer, 408/996-1010, 8/230 \$4679.** Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. **Aug 93**

★★★★★ **Quadra 840AV, Apple Computer, 408/996-1010, 8/230 \$4069.** Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. **Dec 93**

★★★★ **SCSI MicroDock, Newer Technology, 316/685-4904, \$175.** Tiny Duo docking station is just under 4½ ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. **May 94**

★★★★★ **SledgeHammer2000FMF, FWB, 415/474-8055, \$3179.** RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. **Apr 94**

★★★ **SmartStack, Envisio, 612/628-6288, SmartSource \$119; SmartModules \$289 to \$1379.** The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. **Sep 93**

★★★ **Turbo 040, DayStar Digital, 404/967-2077, \$1899.** This accelerator card is equipped with the fastest 68040 chip available, and is as fast as or faster than any Macintosh in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. **Dec 93**

## VIDEO/DISPLAY

★★★★ **AudioVision 14 Display, Apple Computer, 408/996-1010, \$769.** Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. **Dec 93**

★★★★ **Dycam Model 3, Dycam, 818/998-8008, \$895.** Low-end, digital still camera is easy to use, and is a solid product if Instamatic grade gray-scale meets your image-quality requirements. **Sep 93**

★★★★ **Editing Aces Suite, RasterOps, 801/785-5750, \$3899.** Video professionals can record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound with these products. Despite flaws, this package represents a step forward in QuickTime technology. **Nov 93**

★★★★ **Intellicolor Display/20, Radius, 408/434-1010, \$3199.** Although with its exceptional brightness and clarity this monitor would be a fine addition to any designer's desk, the included Intellicolor software, which lets you control the settings of your display, doesn't offer much added value. **Apr 94**

★★★★★ **MovieMovie, Sigma Designs, 510/770-0100, \$349.** This 7-inch NuBus video-capture board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. **Dec 93**

★★★ **PaintBoard Turbo, RasterOps, 408/562-4200, \$1499.** Midrange video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. **Oct 93**

★★★ **VideoToolkit 2.0.1, Abbate Video, 508/376-3712, \$279.** Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. **Sep 93** **m**



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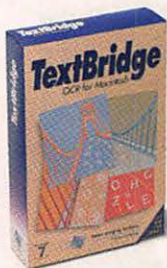
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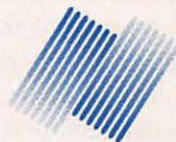
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# Streetwise Shopper

## SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

### Selected and edited by Charles Barrett

The following product listings include time-sensitive promotions being sponsored by Macintosh vendors and their resellers, as well as long-term price reductions and bundling arrangements. Each listing indicates which products have been awarded a star rating in *Macworld's Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an **Editors' Choice**, or have won a **World-Class** award. In some cases, the editorial evaluation quoted is for an earlier product version.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld*, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

### BUNDLES

#### Living Desktop 1.0 + EAC Online Connection Kit

Mantis Development is offering this \$94.95 Pixel Pattern bundle free (except for \$5 credit-refunded processing fee) to all online service users. Living Desktop provides automated desktop-background customization in the Pixel Pattern graphic format; it comes with 150 patterns, plus the option to upgrade to version 2.0 for \$19.95. The Electronic Artists Consortium Online Connection Kit (which includes EAC membership for one year) gives EAC members computerized access to Pixel Pattern artwork plus free and discounted graphics software. For further details, call 800/230-6434. *Offer expires 8/5/94.*

**ScanJet IIp + WordScan 1.1** Hewlett-Packard is offering a free copy of Calera Recognition Systems' \$295 WordScan OCR software (Jun 92 ★★★ for version 1.0) to buyers of its \$599 ScanJet IIp 8-bit flatbed gray-scale scanner (1993 **World-Class**; Aug 92 ★★★★★), the price of which has been lowered by more than 30 percent. For more information, call 800/722-6538.

**TelevEyes/Pro + Action SE** Digital Vision is including a special version (limited to six templates, edited-down documentation, and no clip media) of Macromedia's \$495 Action multimedia-integration program (Mar 93 "First-Time Authoring" **Editors' Choice**; Feb 93 ★★★★★ for version 1.0) with its \$799.95 computer-to-TV video-scan converter with genlock for output to flicker-free composite video or S-Video. Call 800/346-0090 to order, or for more information.

**WriteNow 4.0 + Correct Grammar 3.0 + Calendar Creator 1.0 + KeyFonts** The Mac Zone is offering a software bundle (# 99045) consisting of WordStar International's \$119.95 WriteNow word processor (Jun 94 ★★★★★), the Writing Tools Group's \$79.95 Correct Grammar, Spinaker Software's \$69.95 Calendar Creator, and Softkey's

\$59.95 KeyFonts for Macintosh collection of 100 new typefaces. Available for \$99.92 by calling 800/436-0606. *Offer not to expire before 6/30/94.*

### COMPETITIVE UPGRADES

**PowerPrint 2.5** GDT Softworks is offering this \$149 printer-driver utility (Sep 93 "Maximize Your Printer" **Editors' Choice** for initial release) for \$75 to registered users of competitive products such as MacPrint and Grappler IIsp. PowerPrint lets more than 1000 PC-based printers become Mac-compatible. For more information, call 800/663-6222.

**Redux Deluxe 2.5** Inline Software is offering this \$79.95 backup software (Jan 94 ★★★ for version 2.0.2) for \$40 to owners of competitive backup programs. This upgrade now includes Aladdin Systems' \$59.95 SpaceSaver, an extension of Stuffit Deluxe (Aug 93 ★★★★★) that provides background compression and automatic decompression. Call 800/453-7671 for more information.

### DISCOUNTS/REBATES/SPECIAL OFFERS

#### Apple Workgroup Server + PowerPC Logic Board

Apple Computer is offering a \$500 mail-in rebate to customers who purchase either a Workgroup Server 60 or 80 before 4/30/94, plus a Workgroup Server PowerPC logic-board upgrade before 10/31/94 once it becomes available this summer. A mail-in rebate form can be obtained from authorized resellers. *Offer expires 11/15/94.*

**ArtPack** Olduvai is offering this "best-of" assortment, which has been selected from the ArtFont and ArtClips collections, free of charge (except for S&H). Valued at \$59, it includes six display fonts and 25 professionally created images in EPS format. For more information, call 800/548-5151. *Offer expires 6/30/94.*

**Compton's Interactive Encyclopedia** Compton's NewMedia has reduced the 1994 edition price of this CD-ROM encyclopedia, which includes video clips as well as photos and reference materials, from \$395 to \$149.95. For further information and to order, call 800/862-2206.

**CompuServe Information Service** CompuServe has cut its hourly rates for online service by 40 percent. For 9600-bps and 14,400-bps service, the rate drops from \$16 to \$9.60 per hour; for 1200-bps and 2400-bps service, from \$8 to \$4.80. For more information, call 800/848-8199.

**EtherWave AAUI Transceivers** Farallon Computing is offering Power Macintosh owners up to two \$129 EtherWave AAUI transceivers for \$89 each. These transceivers provide 10BaseT Ethernet network connectivity and allow for daisy-chain configuration. Call 800/795-7761, ext. 1, for proof-of-purchase requirements. *Offer expires 6/30/94.*

**IntelliColor Display/20; PrecisionColor Display/20v** Radius has reduced prices for two of its 20-inch color monitors. The IntelliColor Display/20 drops from \$3199

to \$2299; the PrecisionColor Display/20v, from \$2199 to \$1999. Call 800/227-2795 for reseller information.

**Macintosh Product Registry** Redgate Communications is offering this comprehensive registry in either print (released quarterly) or CD-ROM (released semiannually) format. The registry currently contains more than 6800 in-depth descriptions of Macintosh third-party products. An initial CD-ROM release is available for \$59, with semiannual updates priced at \$39 each. An annual subscription to the print version is \$40; volumes can be purchased individually for \$14.95 each. Call 800/333-8760 to order.

**Microsoft Plus** Microsoft is offering extended services and product discounts to registered users of its products through this not-for-profit program. Services include express access to phone support service for Microsoft applications, a productivity-oriented *Microsoft Plus* bimonthly journal, and access to the Microsoft Plus Forum on CompuServe (with 30 days of no-charge connect time). Annual membership is \$39. Registered Microsoft product owners can enroll by calling 800/999-5505.

**MultiClip 2.1.7** Olduvai continues to offer this next-to-most-recent version of its \$149 Clipboard/Scrapbook-replacement utility direct (800/548-5151) for \$9.95 (plus S&H). Purchase includes a free MultiArt collection of clip art and sounds, plus a special MultiClip 3.0 upgrade price of \$39.95. *Offer expiration extended to 6/30/94.*

**Mutoh Plotters/Projection Panels** Mutoh America has reduced the prices of its XP-500 series of pencil/pen plotters and ViewPoint color LCD projection panels. The XP-511 (D-size, sheet-feed) plotter drops from \$4800 to \$3495; the XP-510 (E-size, sheet-feed), from \$6300 to \$4495; and the XP-510R (E-size, roll-feed), from \$7595 to \$5695. The VP-100 panel goes from \$5595 to \$3995; the VP-200, from \$8995 to \$7595. The VP-300 LCD projector drops from \$13,495 to \$9995. Call 708/952-8880 for more information.

**NetWare 4** Novell has extended an offer whereby customers who purchase and register NetWare 4 by 12/31/94 automatically receive all updates and upgrades at no additional charge through 3/31/95. Enhancements are to include operating system updates, utilities for building NetWare Directory Services directory trees, and bindery synchronization tools for more tightly integrating NetWare 4 with NetWare 3. *Offer expires 12/31/94.*

**Newton Intelligent Messaging Lease** Apple Computer is offering a Newton MessagePad personal digital assistant (Dec 93 ★★★★★), a Newton Messaging Card, and an Apple Wireless Messaging Service lease program through BellSouth's MobileComm at \$49.95 per month for local coverage (includes local paging service and up to 100 text messages) and \$69.95 per month for nationwide coverage (up to 125 text messages). At the end of a 24-month lease, customers may purchase the MessagePad and Messaging Card for \$89, or continue the lease with a \$10 monthly discount. To order service, call 800/474-6374. **m**



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# Macworld

## Advertiser Index

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03 ☐ 99 - 25  
04 ☐ Under 25

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07 ☐ Mac LC/LC II/Performa 430/405/  
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08 ☐ Mac PowerBook-series/Duo-series

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E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

- 21 ☐ Initiate/Determine need for product/capabilities/features  
22 ☐ Evaluate, recommend, or approve brands/models  
23 ☐ Evaluate, recommend, or approve purchase source  
24 ☐ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

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28 ☐ \$99,999 - \$50,000  
29 ☐ \$49,999 - \$10,000  
30 ☐ Under \$10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

- 31 ☐ Business software (Word processing, spreadsheet, database, etc.)  
32 ☐ Graphics/publishing software  
33 ☐ Monitors/displays  
34 ☐ Printers/scanners  
35 ☐ Networking/communications hardware and/or software  
36 ☐ Multimedia/AV hardware and/or software  
37 ☐ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

- 38 ☐ Computer Reseller/VAR/VAD  
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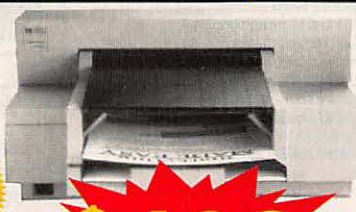
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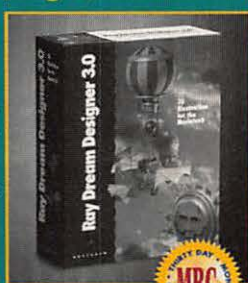
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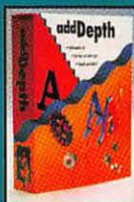
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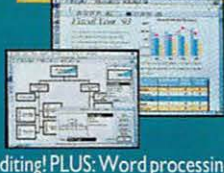
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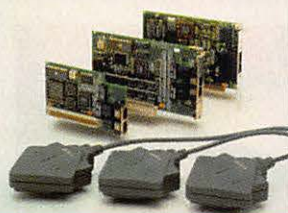
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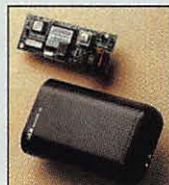
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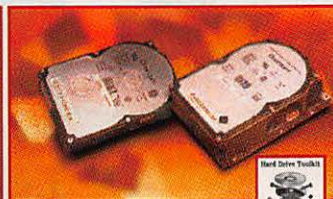


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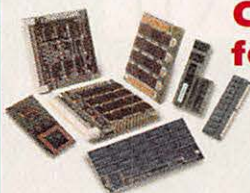
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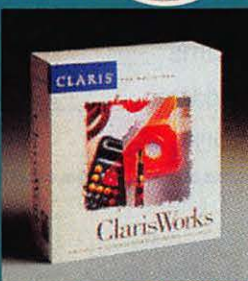
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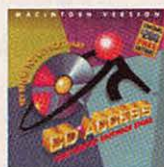


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85MB	3.5" LP 17ms	\$155	\$205
170MB	3.5" LP 17ms	\$180	\$240
240MB	3.5" LP 10ms	\$235	\$295
270MB	3.5" LP 10ms	\$275	\$335
340MB	3.5" LP 10ms	\$285	\$345
540MB	3.5" LP 10ms	\$475	\$535
1000MB	3.5" HH 10ms	\$855	\$915
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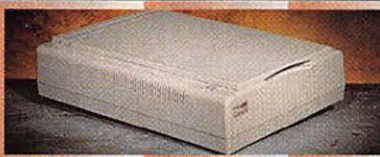
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Sony SDT-4000	4Gbyte	3.5"HH	\$995
Sony SDT-5000	5-16 Gbyte	3.5"HH	\$1299
Exabyte 8200	2Gbyte	5.25"FH	\$1299
Exabyte 8500	5Gbyte	5.25"FH	\$2199
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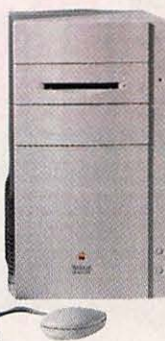
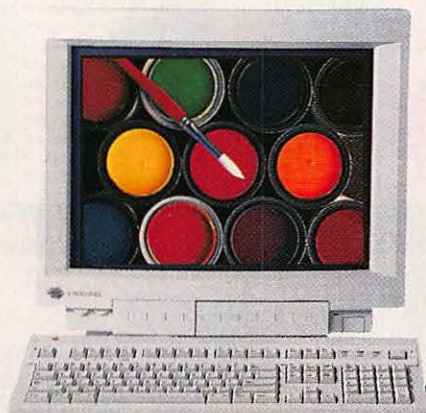
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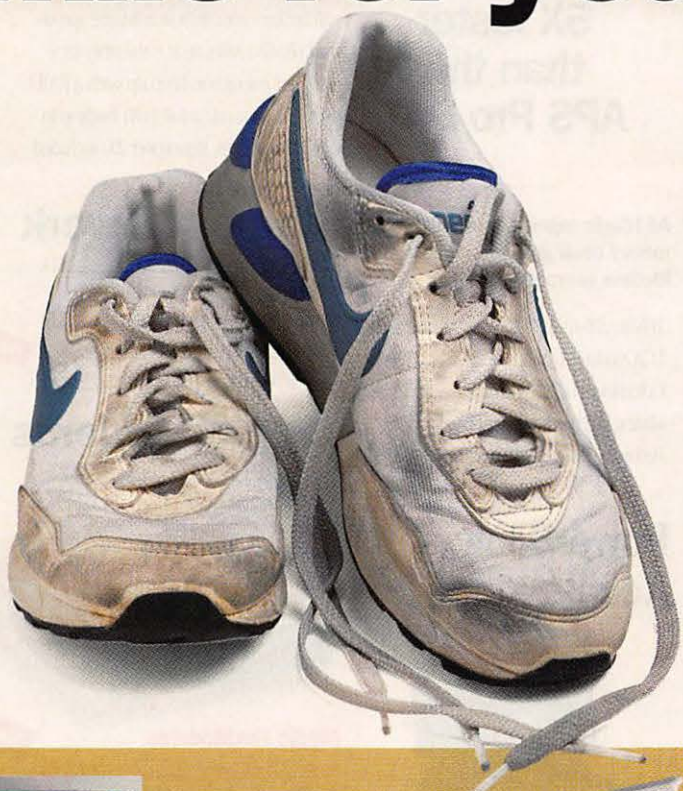
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Quantum LPS	240	270	340	525
Quantum PRO	700	1225	1800	
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- **Twice the warranty 2 years**
- **Better Software than APS or FWB**
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The 128 mechanism used in the Magic 128 Magneto-Optical was rated in

MacWorld December 93 as being 15% faster overall than the Fujitsu 128. The Magic 128 Optical has a max transfer rate of 3.3 MB/Sec using a split head laser design.

Magic 128 Optical \*\* .....\$719  
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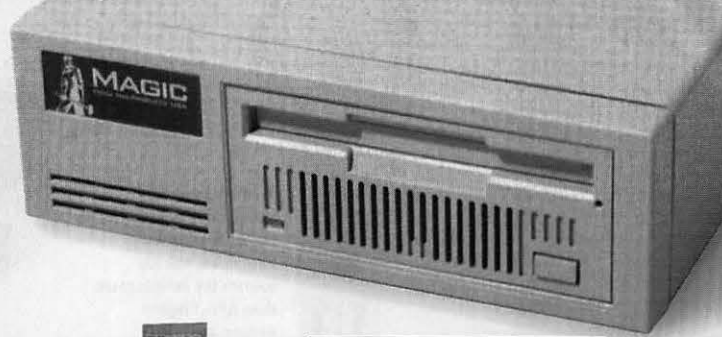
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**Absolute CD-ROM Compatibility and Blazing Speed. The AllCache™ driver software replaces your CD-ROM drive's original driver software, allowing drive access functions to be sped up significantly.**

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**Tl MicroWriter**  
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Lemanse GT \$1899.00  
Sony 14/1730 \$589/1049.00  
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Daystar 50 PowerCache \$430.00  
Daystar PowerMac Call  
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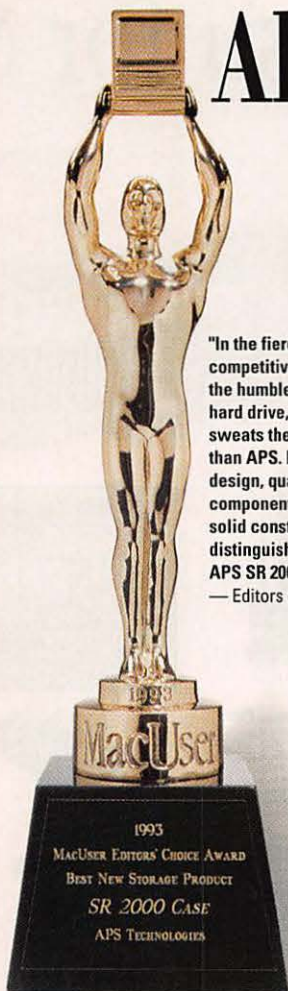
Circle 186 on reader service card

**M64MW**  
MACWORLD June 1994 215





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— Editors of MacUser

# All Drives Are Not Equal.



## STOP SCSI VOODOO

DaTerm, APS' own patent-pending digital active termination technology helps you end SCSI Voodoo by eliminating SCSI line pulse fluctuations, as well as confusing signal and voltage reflections. Its unique impedance-matching characteristics provide superior signal-to-noise ratios, decreases SCSI retries, allows more reliable data transmission and improves SCSI chain stability. DaTerm is available in the award-winning APS SR 2000 enclosure, as well as our new portable Companion II enclosure and SCSI Sentry™.

## SR 2000 StacKIT™ \$24

- End Cable Bondage Forever!
- Minimize SCSI Chain Length
- Heavy Metal Shielding Protects SCSI Signal
- StacKIT Includes Four Concave Stacking Feet
- StacKIT Includes Exclusive APS SCSI C "Connector"



## Just \$99 SCSI Sentry™

Now you can "stop SCSI Voodoo" on your SCSI Chain, even when you're not ready to buy a new drive. Our new SCSI Sentry™ gives you all the benefits of APS' acclaimed DaTerm technology in the form of an external SCSI performance monitoring instrument.

Benefits	SCSI Sentry
Optimizes Overall SCSI Performance	✓
Exclusive Digital Active Termination	✓
Provides Ideal Termination Power	✓
Drastically Reduces SCSI Retries	✓
Regulates SCSI Line Voltage	✓
Solves Bus Impedance Issues	✓
LED Activity Indicators Diagnostic Tool	✓
Easy Installation: Takes Seconds	✓

## APS HARD DRIVES

Model	Capacity	Internal	SR2000
-------	----------	----------	--------

### 163MB - 1029MB

APS Q 170 <sup>2</sup>	163MB	229	319
Quantum 170 LPS mechanism			
APS MX 240 <sup>2</sup>	234MB	259	349
Maxtor 7245 mechanism			
APS Q 270 <sup>2</sup>	257MB	359	449
Quantum LPS270 mechanism			
APS MX 290 <sup>2</sup>	276MB	329	419
Maxtor 7290 mechanism			
APS MX 345 <sup>2</sup>	324MB	339	429
Maxtor 7345 mechanism			
APS 340 <sup>2</sup>	327MB	429	519
340 mechanism			
APS Q 540 <sup>2</sup>	516MB	529	619
Quantum 540 mechanism			
APS MS 1.2AV <sup>5</sup>	965MB	999	1089
Micropolis 2210AV mechanism			
APS MS 1.2 <sup>5</sup>	1001MB	899	989
Micropolis 2210 mechanism			
APS MS 4110 <sup>5</sup>	1002MB	999	1089
Micropolis 2210 mechanism			
APS Q 1080 <sup>5</sup>	1029MB	859	949
Quantum 1080S mechanism			

• Internal drives for Quadra 800 and Centris 610 available.

\* Internal Price Listing

Model	Capacity	Internal	SR2000
-------	----------	----------	--------

### 1611MB - 2845MB

APS ST 1.6 <sup>5</sup>	1611MB	\$1499	\$1589
Seagate ST 11950 Barracuda mech.			
APS MS 1.7AV <sup>5</sup>	1612MB	1399	1489
Micropolis 2217AV mechanism			
APS MS 1.7 <sup>5</sup>	1682MB	1299	1389
Micropolis 2217S mechanism			
APS ST 2.0 <sup>5</sup>	2040MB	1869	1959
Seagate ST 125500N Barracuda mech.			
APS MS 2.4G <sup>5</sup>	2100MB	1599	*1699
Micropolis 1926 mechanism			
APS MS 3.0G <sup>5</sup>	2845MB	2249	*2349
Micropolis 1936 mechanism			

1-5 Denotes length of manufacturer's warranty

\* External Case is Special Full Height Only

## POWERBOOK DRIVES

Model	Capacity	LW Pro 630	Internal	Companion II AC/DC
APS PB 85 <sup>1</sup>	80MB	\$249	—	—
APS PB 170 <sup>1</sup>	160MB	349	\$299	\$439
APS T 213 <sup>1</sup>	202MB	409	359	499
APS PB 250 <sup>1</sup>	240MB	449	399	539
APS T 340 <sup>1</sup>	324MB	579	529	649
APS T 520 <sup>1</sup>	500MB	949	899	1039

## APS MX 290

The APS MX 290 provides great performance with transfer rates of 1.8MB per second, access speeds of 24 ms and seek times as low 13.1 ms. This 276MB drive is a terrific upgrade for any Mac.

**\$329\***



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*All DATs Include Retrospect, a \$139 Value. Free!*

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If you need high-speed backup (not the kind that ties your server up and slows down your network), you need the DDS-2 power of the APS HyperDAT! Back up locally at rates as high as 28MB per minute! Pack up to 10GB on a single tape! Best of all, your regular DDS and DDS compression tapes can be read in the APS HyperDAT, too!

## DAT

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APS HyperDAT <sup>1</sup>	8-10GB on 120m tape	1449	1499

\*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.  
60 meter DAT Tape - \$12, 10 Pack - \$110  
90 meter DAT Tape - \$16, 10 Pack - \$130  
120 meter DAT Tape - \$35, 10 Pack - \$300

All APS DAT Drives Include Retrospect by Dantz & 1 FREE DAT Tape

## CD ROM

Model	SR 2000
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APS T 3401 <sup>1</sup>	499

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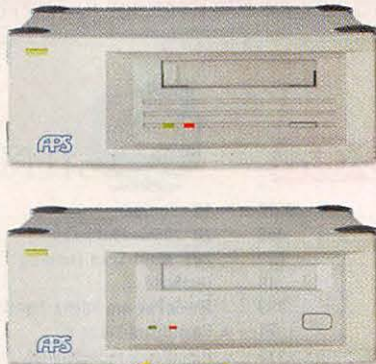
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‡ All prices and specifications are subject to change without notice.  
§ Refund orders subject to restocking fee.  
|| First drive included in bundle; cables, cords and I/O required for operation with the specified Macintosh; where applicable. All hard drives from APS Technologies come preformatted with Apple's System 7.1.1 software, at least 1MB of compacted publicly-distributable software, and APS Technology's APS VMEB TOOLS SCSI Formatter/Track disk partitioner.  
¶ All external drive products and cases with a minimum 25 x 80 SCSI cable. Companion II drives, (not cases) include a 30 x 100 PowerBook SCSI cable.  
|| International customers must pay for all shipping charges.  
|| Full drive technical support is available. Regular business hours 9 a.m. Monday thru Friday, 9 a.m. to 6 p.m. Saturday, Central Time.

**APS DAT**  
**\$799**



## APS HyperDAT™

**\$1499**

1993/94 Macworld Magazine World Class Award - APS Hard Drive Series Readers' Choice



## MAGNETO OPTICAL

Model	Internal*	SR 2000
APS 128MB MO <sup>1</sup>	\$769	\$799

Mechanism is Epson/Olympus Magneto-Optical  
All MO Drives Include 1 FREE Cartridge  
128 MO cartridge - \$49 unformatted, \$55 formatted

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APS T 155 MB Tape Backup <sup>2</sup>	\$479
---------------------------------------	-------

155MB Backup Tapes - \$19, 10 Pack \$170  
\*Only Available in ZIP Case.

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Palm-Sized 25-30 PowerBook SCSI Adapter that includes a docking adapter for PowerBook and termination power indicator.  
Receive Power-Merge Lite Free with every APS SCSI DOC!

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Rugged Palm-Sized 25-30 PowerBook SCSI Adapters

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Brighten up that dull granite with a colorful APS PowerBall. Manufactured to the same exacting specifications as the Apple original, the APS PowerBall lets you customize your PowerBook® environment.



All APS Drives Are Power PC Mac Compatible!

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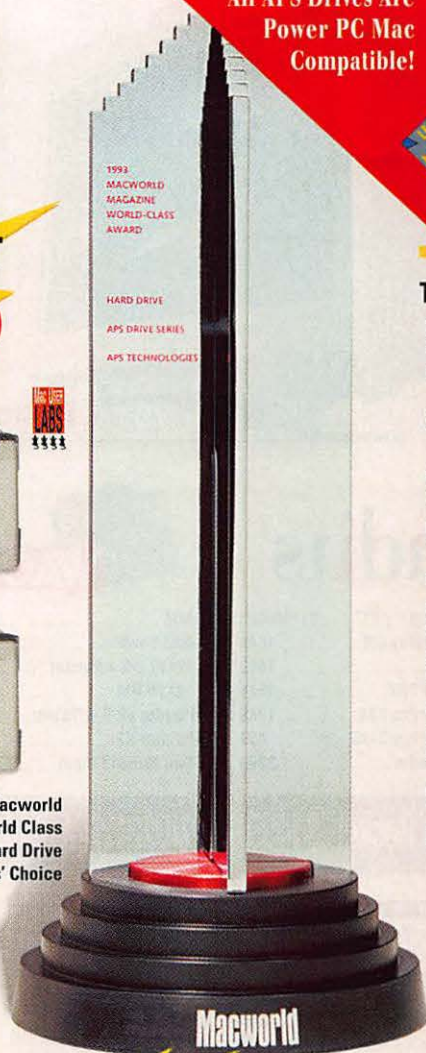
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APS SQ 3105 <sup>1</sup>	105MB	429
APS SQ 3270 <sup>1</sup>	270MB	659

† Does not format 44MB cartridges  
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105MB cartridges - \$59 unformatted, \$64 formatted  
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Circle 62 on reader service card

MACWORLD June 1994 217





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Precision Color 20V .....	1575
★ Precision Color Pro 24X .....	1245
Precision Color Pro 24XP .....	439
VideoVision Studio .....	3299

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ArtZ Bundle .....	469
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12X18 RM .....	719
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Spectrum Power 1152 .....	\$1179
★ SuperMatch 20 Txl .....	2149
PressView 21" Trin. ....	3249
★ Digital Film Delux .....	3199
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Quadra 660AV	1529
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Deskwriter 550C/310	539/350
Fargo Primera	880
GCC	Call
HP 4ML/4MP	1099/1475
LaserWriter Pro 630/810	2075/4599
LaserWriter Select 360	1525
★ Proof Positive	6695
QMS 860 Plus	5299

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DGR 105 keyboard	\$85
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Granite Active Terminator	39/59
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Seagate Elite 3.4GB	2249
Tahoe 128 Optical	920
Toshiba 340 PowerBook	669
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75E	\$1199
CPD 1730	1025

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V.32bis PB	219

## Global Village



Gold	\$277
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105/270mb Cart.	55/97

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# DGR Technologies



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Upgrade your LC, LCII, LCIII and Performa 400 with the LC MAX. Increase the single expansion slot to four, add another hard drive and supplement your LC with an additional 40 watt power supply. Conflicting cards can be easily switched on or off as needed. Enter the world of Multi-Media with the Multi MAX! Equipped with a multi-session, double spin CD-ROM, and amplified stereo speakers, you can access the vast library of CD-ROMs available or listen to your favorite music.

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High speed RAID technology at a real world price. The DGR Power Raid Storage System is a RAID level 0 and 1 and/or level 0,1,4, and 5 array system. Access time is 4ms with transfer rates up to 10 MB/Sec (Sync) at RAID levels 0 and 1 using a 1.0 GB array on a 840av. The system is compatible with SCSI 1 and 2, SCSI Manager 4.3 (Async), and will work with all Power PC and Mac AV platforms. RAID enclosures are all metal construction complete with all cables and software. The Power Raid Storage System provides its own SCSI chain via a Nubus SCSI 2 card, allowing you to add more RAID enclosures as you need them.

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DGR Technologies is committed to the excellence that has made us the industry leader. Each drive is shipped in an all-steel case with a universal 40 watt power supply, double-shielded SCSI cable, external terminator and a free cartridge. (Also for PC's!)



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**Circle 65 on reader service card**

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★ Turbo 040 40MHz.....	1092
Turbo 040i 33MHz.....	739



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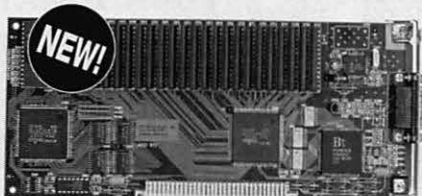
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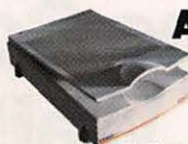
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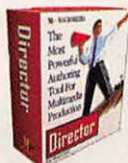
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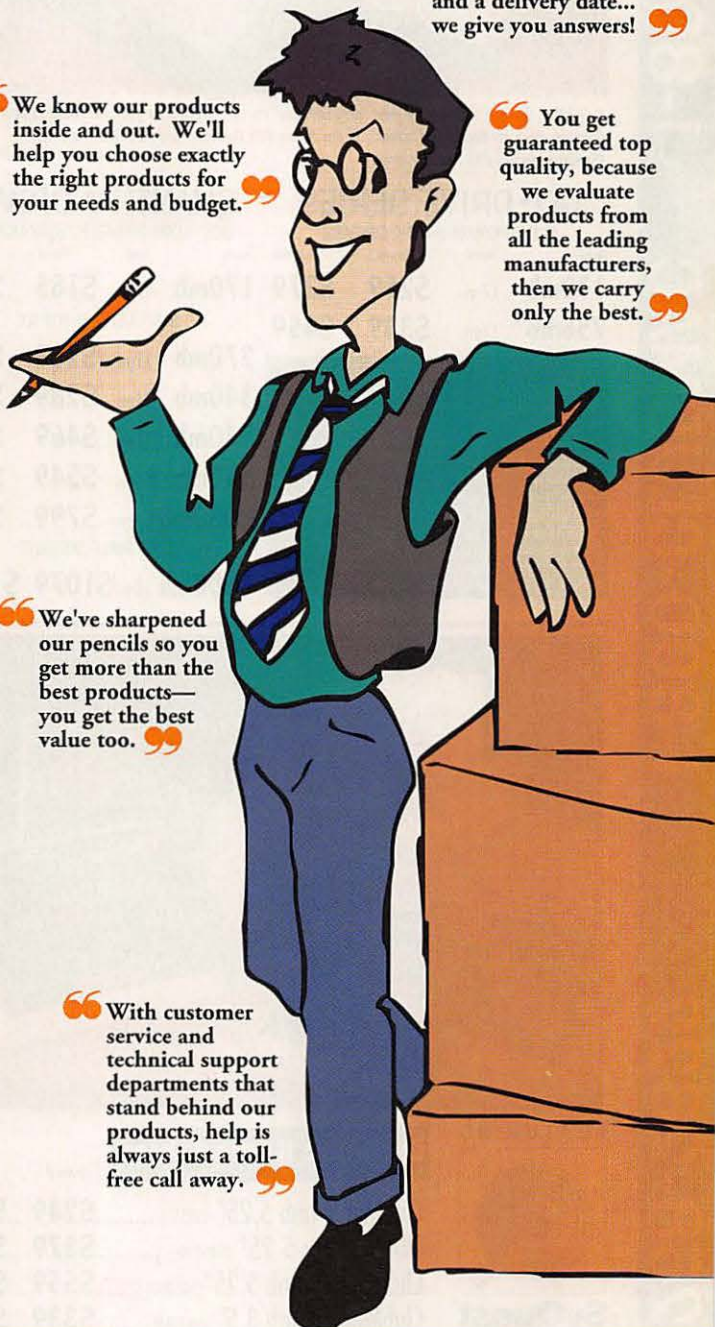
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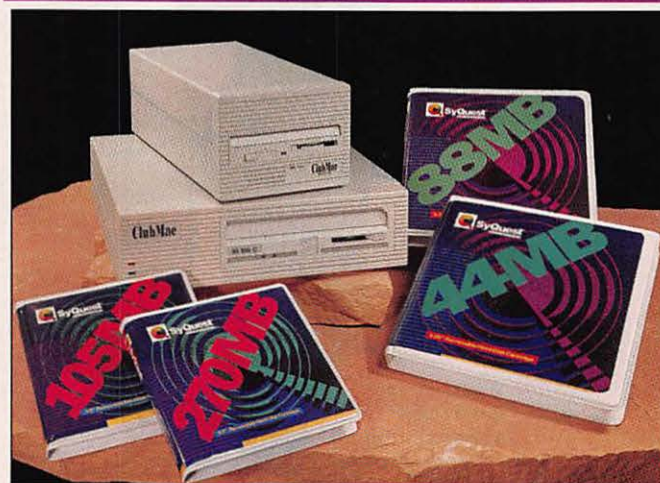
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- 20 sec average data access time (60m tape)
- 28mb/min backup rate, 366KB/sec transfer rate
- MTBF of 180,000 hours
- ONE Year Warranty
- Includes Retrospect Remote v2.0 (3 pack) Network Backup Software and ONE 120m Tape Cassette

## FREE

RETROSPECT REMOTE V2.0 BACKUP SOFTWARE (\$249 VALUE)



Capacity	Model	Format	Media	Internal	External
2.0GIG	ClubMac DAT	DDS	60m, 90m	\$749	\$799
2-4GIG	ClubMac DAT/DC	DDS-DC	60m, 90m	\$999	\$1049
4-8GIG	ClubMac DAT/2	DDS-2	60m, 90m, 120m	\$1329	\$1379

## Verbatim

### DAT TAPES

10 pack

### OPTICAL MEDIA

## MEDIA PRODUCTS

4mm (60m) ...\$12 / \$110	3.5" 128mb.....\$35
4mm (90m) ...\$15 / \$125	5.25" 594mb/652mb.....\$89
4mm (120m) ...\$29 / \$250	5.25" 1.2GIG/1.3GIG...\$115

# CLUBMAC OPTICAL DRIVES



## CLUBMAC 3.5" 128MB OPTICAL

"Low price and all-around value characterize this 128mb rewritable drive."

-Macworld Editors' Choice December 1993



## CLUBMAC 5.25" 650MB OPTICAL

"Without question the best bargain among 5.25" drives."

-Macworld Editors' Choice December 1993

	Internal	External
ClubMac 3.5" 128mb Fujitsu Optical (M2511A)	\$839	\$869
Fujitsu 3.5" 128mb Dynamo		\$869
ClubMac 3.5" 128mb Epson Optical	\$759	\$789
ClubMac 5.25" 650mb Sharp Optical	\$1669	\$1699
Hewlett-Packard 5.25" 1.3GIG Optical External		\$2699

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.



# Seagate

Seagate drives offer the highest performance and capacity at a price point that is affordable for any Macintosh user. Capacities range from 1 Gigabyte to 2.4 Gigabytes. Seagate surpasses the competition with an industry-leading 7200 RPM rotation speed which makes for the fastest drives.

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
<b>3.5" LOW PROFILE</b>						
1.2GIG	ST31200N		10ms	1000mb	\$869	\$929
<b>3.5" HALF HEIGHT</b>						
1.9GIG	ST11900N		9ms	1600mb	\$1199	\$1259
2.4GIG	ST12400N		9ms	2000mb	\$1549	\$1609
1.9GIG	ST11950N	Barracuda 1	8ms	1650mb	\$1489	\$1549
2.4GIG	ST12550N	Barracuda 2	8ms	2050mb	\$1745	\$1805



# NEC

## MultiSpin CD-ROM Readers

### MultiSpin 3Xe



**\$589**  
MultiSpin 3Xe

The 3Xe is our highest performing triple speed external reader. It transfers data at 450 KB/sec, has an incredible 195ms access time and a 256 KB continuous-flow cache. Another MultiSpin 3Xe ErgoDesign feature is that it can be used in either a horizontal or vertical orientation.



### MultiSpin 3Xp



**\$439**  
MultiSpin 3Xp

For users that want to discover the world of multimedia the 3Xp Personal CD-ROM reader is perfect for use in the office, home or on the road. It combines 3X transfer rate performance, 250ms access time and a 256 KB continuous-flow cache in a compact design, making it an incredible value.

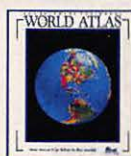
MultiSpin 3Xe (CDR-600) (External, 195ms access time) .....	w/o bundle \$589	w/bundle \$689
MultiSpin 3Xi (CDR-500) (Internal, 195ms access time) .....	\$499	\$599
MultiSpin 3Xp (CDR-400) (Portable, 250ms access time) .....	\$439	\$539
MultiSpin 4X Pro (CDR-900) (External, 180ms access time) ...	\$935	\$1035

NEC MultiSpin CD-ROM Readers include Macintosh Interface Kit and a TWO Year Warranty. NEC MultiSpin CD-ROM Readers are MPC Level 2, QuickTime and Kodak Multisession Photo CD compliant.

## CLUBMAC CD BUNDLE \$800 RETAIL VALUE!



The Animals



The Software Toolworks  
Atlas Pack (World) v3.0



The Software Toolworks  
Atlas Pack (US) v3.0



The Software Toolworks  
Encyclopedia v6.0



Mayo Clinic



Lucas Game Pack II



Pair of QuickShot Speakers

## NETWORKING

# ASANTÉ

**FIVE  
YEAR  
WARRANTY**



**\$297**  
Mini EN/SC

10THUB/12	10BT Hub w/12 10T, Thk & Thn ports.....	\$465
10THUB/8	10BT Hub w/8 10T, Thn port.....	\$229
Mini EN/SC	Thn/10BT SCSI Ether w/DT & PB cable.....	\$297
Mini EN/SC10T	10T SCSI Ethernet w/DT & PB cable.....	\$237
FN10TA	10T FriendlyNet Media Adapter.....	\$65
FNTNA	Thn FriendlyNet Media Adapter.....	\$65
MC+IIE64	Mac II & Perf 600, Thk/Thn, 64K.....	\$139
MAC+IIE64	Mac II & Perf 600, Thk, 10BT, 64K.....	\$139
MC3NB	Mac II & Perf 600, Thk/Thn/10BT, 64K.....	\$189
AP1001	AsantéPrint, Thk/10BT or Thk/Thn.....	\$329

*Sonic Systems, Inc.*

## NETWORK PRODUCTS



**\$235**  
microSCSI

**microSCSI**



**\$197**  
StarBase T/9

**StarBase T/9**

### Ethernet Adapter Products

3 in 1 Card (Nubus, PDS, SE, LC) .....	\$125
Thick/Thin Card (Mac II, LC) .....	\$89
Thick/10BaseT Card (Mac II, LC) .....	\$89
microSCSI PowerBook .....	\$235
microSCSI Desktop .....	\$219

Apple AUI Ethernet Adapters(Quadrans, Centris, Lasers, WGS)

Single Port 10BaseT or Thin .....	\$49
Dual Port 10BaseT and Thin.....	\$75
Multiple AAUI products .....	\$89

### Ethernet Hubs

StarBase T 9 Port (8-RJ-45, 1 BNC) .....	\$197
HubLite 5 Port 10BaseT Hub .....	\$145

# DAYSTAR

D I G I T A L



## POWERPC PRODUCTS

66 MHz PowerPro 601 (000728) .....	\$1499
80 MHz PowerPro 601 (000735) .....	\$1999
FastCache PowerPro-1MB Cache (000742) .....	\$499

## TURBO 040 ACCELERATORS

Turbo 040 (with FPU support)	
33 MHz Turbo 040 w/128K cache (000773) .....	\$799
40 MHz Turbo 040 w/128K cache (000797) .....	\$959
FastCache Turbo (000223) .....	\$165
Turbo 040i (w/o FPU support)	
33 MHz Turbo 040i w/128K cache (000780) .....	\$629

## APPLICATION ACCELERATORS

Image 040 (Quadra/Centris) (000414) .....	\$1549
Quad 040 w/128K cache (Quadra/Centris) (000056) .....	\$959

## POWERCACHE

	W/O FPU	W/FPU
33 MHz PowerCache (P31UV-033) .....	\$275	\$359
50 MHz PowerCache (P31UV-050) .....	\$415	\$539
PowerCache Adapter* .....	\$99	

\* Req'd for non-Mac IIci, IIvi, IIvx, Performa 600

Warranties: All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty. Money Back Guarantee: All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers' return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when specified. Returns: Call for RMA number! Any product that is returned WITHOUT an RMA number will be refused. All product information and prices are subject to change without notice. Not responsible for typographical errors.



No Surcharge!



### Turbo 040i (without FPU)

- Ideal for word processing, spreadsheet (except recalc), page layout and graphic applications
- The inexpensive, optional FastCache Turbo (128K cache) is available for achieving maximum '040 performance
- Supports Mac SE/30, II, IIx, IIcx, IIci, IIvi, IIvx and Performa 600

### Turbo 040

- Includes complete Motorola 68040 CPU with math chip. Ideal for imaging, rendering, complex spreadsheet recalc and scientific applications
- Supports the Mac SE/30, II, IIx, IIcx, IIci, IIvi, IIvx and Performa 600



### Universal PowerCache

The award-winning PowerCache is a 68030 CPU accelerator that offers speed increase from 200% for a Mac IIci to 1,000% for a Mac Classic. It's guaranteed 100% compatible running at full speed and doesn't require additional memory. Just plug it and go... no downtime and it works with everything.

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Fax (714)768-9354 • 7 Hammond, Irvine, CA 92718



# EPSON



## Epson ES-800C Pro-Mac



MW ★★★★★  
August 1993

**\$1249**  
ES-800C Pro-Mac

ES-800C Pro-Mac ..... \$1249

Scans up to 1600dpi, Photoshop 2.5, ScanTastic, KAI's PowerTools

ActionScanning-Mac ..... \$799

Scans up to 1200dpi, Photoshop 2.5 LE & ScanTastic

# MICROTEK

Better Images Through Innovation.

## Microtek ScanMaker IIsp



**\$799**  
ScanMaker IIsp

ScanMaker IIsp with Photoshop 2.5 LE ..... \$799

ScanMaker II with Photoshop 2.5 LE ..... \$665

ScanMaker IIx with Photoshop 2.5 ..... \$1049

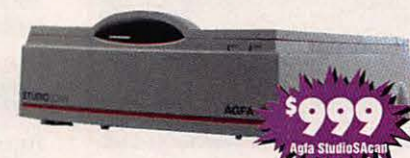
ScanMaker IIg with Fractal Design Sketcher 1.0 ... \$489

# AGFA



## Agfa StudioScan

...StudioScan from AGFA.  
So much scanner for so little money...



**\$999**  
Agfa StudioScan

Agfa StudioScan (FSERA) ..... \$999

StudioScan Transparency Module (FSEQ7) ... \$375

## ClubMac Extended Keyboard



**\$69**  
ClubMac Extended Keyboard

Available in the following version:

- English (KB) • Spanish (KB-SP)
- Swiss (KB-SW) • French (KB-F)
- German (KB-G)

Includes ONE Year Warranty

## Turbo Mouse 4.0 (C4100)



**\$109**  
Turbo Mouse 4.0

MW ★★★★★  
November 1992

MW ★★★★★  
February 1992

- Two Apple Desktop Bus (ADB) Ports
- Large Ball for greater control
- Superior Hardware Design
- Optical Technology
- Programmable Button Commands
- 5 Year Warranty



# SONY

## SONY 17" TRINITRON



## Sony 17SE1 Trinitron monitor

This new 17-inch Trinitron display features a unique Application Specific Integrated Circuit (ASIC), supports resolutions up to 1600 x 1200 at 60Hz, has a 0.25mm Aperture Grille Pitch and is Energy Star compliant

## MONITORS

17" MultiScan Trinitron (GDM-17SE1) \$1185

17" MultiScan Trinitron (CPD-1730) \$1079

# SUPERMAC

Free DSP for a limited time!

## 24-BIT GRAPHIC ACCELERATORS

Thunder/24 v.2.0 (G1130) ..... \$1699

Spectrum Power • 1152 (G3430) ..... \$1169

Spectrum/24 Series V (G3930) ..... \$839

## LARGE SCREEN DISPLAYS

SuperMatch 21TXL Trinitron (STD2102) ..... \$2199

SuperMatch 20TXL Trinitron (STD9752-XL) ..... \$1949

SuperMatch 20 Plus Color (STD9785) ..... \$1649

SuperMatch 17T Trinitron (STD9735) ..... \$1049

SuperMatch 17XL (STD1701) ..... \$999

Platinum 21 Two-Page GS (STD9761) ..... \$999

## MULTIMEDIA SOLUTIONS

Digital Film (DV2050) ..... \$3199

Spigot II Tape (DV1530) ..... \$849

Video Spigot NuBus (DV1030) ..... \$369

Video Spigot LC (DV1050) ..... \$249



**\$1699**  
Thunder/24 v.2.0

## Thunder/24 v.2.0

Fastest 24-bit accelerated color graphics. It is 45% faster. Provides high performance QuickDraw acceleration on 12-21" displays at resolutions from 512 x 384 to 1152 x 870 pixels.



**\$1169**  
Spectrum Power • 1152

## Spectrum Power • 1152

Delivers workstation-class, accelerated 24-bit graphics up to 1152 x 870 so you can work with a full, 16.7 million colors on screens up to 21 inches and execute QuickDraw functions up to 31 times faster than unaccelerated video. And it's 7-inch length enables it to fit into any NuBus Macintosh, even the Quadra 610 and 660AV.

# RASTEROPS CORPORATION



**\$779**  
PaintBoard Lightning

## MONITORS

20"/20T Trinitron (2075R0) ..... \$2489

20"/20 Multiscan Color (2020C) ..... \$1519

21" Mono/GrayScale (2110) ..... \$995

17" ClearVue Color ..... \$869

## DUOMATES

DuoMate 8 (2658) ..... \$329

DuoMate 16sc (2659) ..... \$519

## GRAPHIC CARDS

PaintBoard Lightning (2685) ..... \$779

Horizon 24 (2678) ..... \$2259

PaintBoard Turbo XL (2695) ..... \$1129

PaintBoard Professional (2716) ..... \$1799

PaintBoard 8Li (2641) ..... \$319

## MULTIMEDIA

MoviePak Presenter (2690) ..... \$1399

MoviePak 2 (2676) ..... \$1549

MoviePak 2 Pro Suite (2692) ..... \$3289

24XLTV (2548) ..... \$2529

24STV (2536) ..... \$719

Video Expander II (2826) ..... \$499

The RasterOps DuoMate 16sc combines a SCSI interface with support for a variety of bit depths up to 16-bit per pixel (depending on the monitor and resolution). The SCSI interface may be used to connect an external hard disk or other devices such as a SCSI Ethernet adapter. SCSI disk mode is supported to ease file transfers.



**\$519**  
DuoMate 16



**\$1169**  
E-Machines T16 II



## E-MACHINES

## E-MACHINES MONITORS

ColorPage T16II (1108-DT16MR) ..... \$1169

## E-MACHINES GRAPHIC CARDS

24-Bit Futura II SX (EMG013S) ..... \$419

Simply TV (EMG0550) ..... \$369

## DUO DOCKING STATIONS

PowerLink Presenter (5008-PLP) ..... \$419

EtherDock (5008-PLD) ..... \$589



# radius



**\$1249**  
PrecisionColor 17"

**ASK ABOUT RADIUS  
WORRY-FREE  
WARRANTY**

## MONITORS

PrecisionColor/21	<b>NEW</b> \$2149
IntelliColor Display/20 (0381)	\$1929
PrecisionColor Display/20v (0427)	\$1679
PrecisionColor Display/17 (0460)	\$1249
PrecisionColor Pivot (0356)	\$649
Pivot Display (0356)	\$565
Full Page Display (FPD) (0424)	\$489
TPD/20gs/21gs (0436) / (0437)	\$799/\$1005

## GRAPHIC CARDS

LeMansGT	\$1949
PrecisionColor Pro 24X (0429)	\$1349
PrecisionColor Pro 24XK (0422)	\$735
PrecisionColor Pro 24XP (0431)	\$435
PrecisionColor 24X (0422)	\$844

## MULTIMEDIA

VideoVision Studio (0418)	\$3389
VideoVision Studio Upgrade (0419)	\$1529
VideoVision (Basic) (0416)	\$1499

## Get a FREE CD-ROM READER

Purchase one of the following  
Radius graphic cards:

**LeMansGT or  
PrecisionColor Pro 24X**

and get a **FREE**

**NEC MULTISPIN 3Xe CD-ROM Reader**



Offer expires 08/31/94

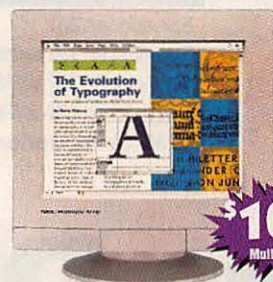
# NEC

## MULTISYNC 6FGp



**\$1999**  
MultiSync 6FGp

## MULTISYNC 5FGp



**\$1099**  
MultiSync 5FGp

**MACWORLD  
MW  
EDITORS'  
CHOICE**  
October 1993  
NEC MultiSync 5FGp

## NEC MULTISYNC MONITORS

15" MultiSync 3V (JC-1535VMA)	\$469
15" MultiSync 4FGe (JC-1531VMA-3)	\$629
17" MultiSync 5FGe (JC-1731VMA-3)	\$989
17" MultiSync 5FGp (JC-1741UMA-3)	\$1099
21" MultiSync 6FGp (JC-2141UMA-3)	\$1999

NEC Monitors carry a THREE Year Warranty.

## SILENTWRITER 640



**\$719**  
SilentWriter 640

The NEC's SilentWriter Model 640 is a personal laser printer designed especially for the Macintosh. This compact, easy to operate printer delivers an unbeatable combination of professional level performance and print quality at a price most any Mac owner can afford.

## NEC PRINTERS

Silentwriter 640 (640) 6ppm, 300 dpi, PS Level 2, 52 fonts	\$719
Silentwriter 1097 (1097) 10ppm, up to 600 dpi, PS Level 2	\$1379

NEC Silentwriter 640 carries a TWO Year Warranty.  
NEC Silentwriter 1097 carry a ONE Year Warranty.

**hp** **HEWLETT  
PACKARD**  
Authorized Dealer



**\$299**  
HP DeskWriter 520

## HP DeskWriter 520

- Clear, sharp 600 x 300 dpi
- 3 ppm, 35 scalable fonts
- Light weight, only 4.3 lbs.
- Prints on plain paper, transparencies
- Standard LocalTalk/Serial interface
- EnergyStar Compliant

HP DeskWriters carry a  
THREE Year Warranty

HP DeskWriter 310	Optional Color Kit Available	\$299
HP DeskWriter 310	with CutSheet Feeder (50-sheet), Optional Color Kit Available	\$369
DeskWriter Inkjet 520	600 x 300 dpi, 3ppm, 35 fonts, LocalTalk/Serial	<b>NEW</b> \$299
DeskWriter Inkjet 560C	600 x 300 dpi color, 3ppm, 35 fonts, LocalTalk/Serial	<b>NEW</b> \$579

HP DeskWriter 310 carry a ONE Year Warranty

## HP LASERJET 4ML



**\$1029**  
HP LaserJet 4ML

HP LaserJet 4ML 300 x 300 dpi, 4ppm, 35 scalable fonts, Adobe PostScript Level 2	\$1029
HP LaserJet 4MP 600 x 600 dpi, 4ppm, 35 scalable fonts, Adobe PostScript Level 2	\$1395

- Lowest cost HP LaserJet printer for the Mac
- EconoMode cuts your toner costs up to 50%
- Lightning fast Intel 80960 18.8 MHz RISC processor
- Auto-switching between PostScript and enhanced HP PCL 5
- 300-dpi laser printing with HP Resolution Enhancement technology & 4ppm
- 35 PostScript fonts
- 4MB standard memory
- Small 14" x 14.5" footprint saves desktop space
- ONE Year Warranty

**CALL FOR  
FREE  
CATALOG**



No Surcharge!

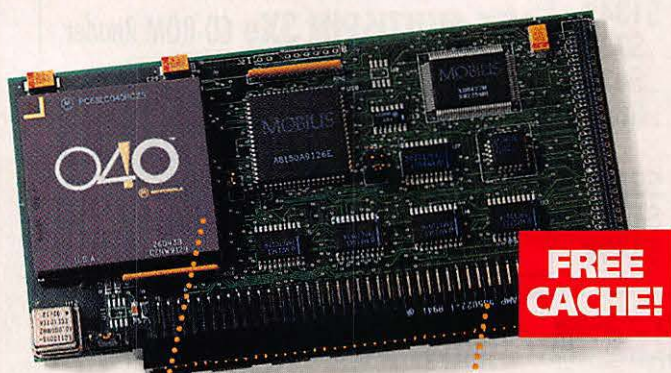
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# '040 Performance Now only \$399.

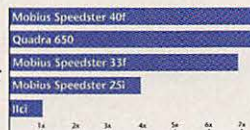


100% Compatibility  
Guarantee with all Macintosh  
software or your money back.

Easy 10 minute installation  
on the Mac IIci, IIsi, IIfx, IIfx,  
Perf. 400, LC and LC II.

Now is the best time to accelerate your Macintosh with the Speedster 040. Starting at just \$399, you can upgrade to '040 power and get blazing, 100% compatible performance from the Mac you already own.

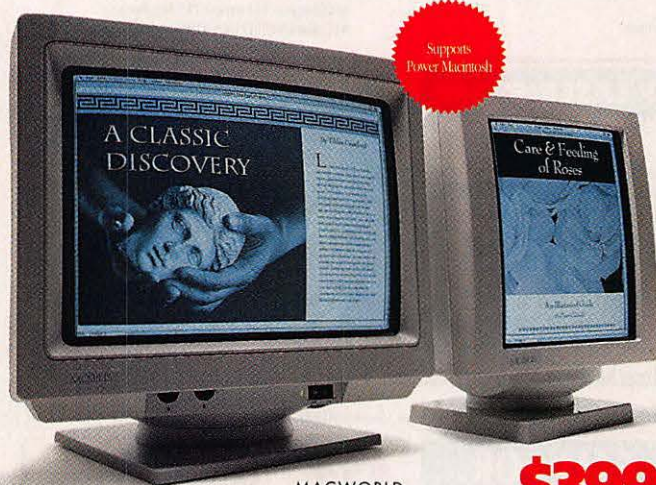
**Speedster 040 runs all your software up to 6X faster!** Plus, its universal, low-cost design uses custom chips, **saving you up to 50% over the competition.** At Mobius, we stand behind you with a 3-year warranty, 30-day money-back guarantee, and unlimited technical **support rated "Excellent"** by MacWorld Magazine. Call today to order and receive your free Macintosh Performance Handbook.



Adobe Illustrator redraws up to 7.3 times faster with the Mobius Speedster 040 Accelerator.

Compare and Save!	Speedster 040™	Daystar Turbo 040™
Speedster 25i	\$399	\$799
Speedster 33i w/cache	\$599	\$999
Speedster 33f w/FPU & cache	\$799	\$1,199
Speedster 40f w/FPU & cache	\$1,099	\$1,399
128K Cache Option	FREE!	\$199

# The Choice Display for all your work.



**\$699**



**\$399**

Why settle for scrolling around on a tiny 13" monitor when you can **view your entire document** on a award-winning Mobius Display. You'll have over three times more desktop! Just plug it directly into your Macintosh and view up to 256 gray-levels\* on the bright, razor-sharp screen. **Now available for over 50 Macs**, Mobius Displays are rated at over 80,000 hours MTBF—the most reliable in the industry. And starting at just \$399, the best value you'll find anywhere. So choose the display that MacWorld named **"Editor's Choice."** Call us today to place your order, and get the Choice Display for all your work.

## Mobius Monochrome Displays

Mobius Two Page Display GS	\$699
Mobius One Page Display GS	\$399
Mobius Mono Video Card	\$99†

# MOBIUS



To Order or Receive Your FREE Performance Handbook:

# 800-800-4334

Circle 109 on reader service card

\*For Macs w/supporting built-in video; video card may be req. call for info. † When purchased with display.  
How to Order: We accept Visa, MasterCard, AmEx and Discover. Corporate and Education POs. Cache is free with Speedster 33i, 33f, and 40f models only. Competitive pricing as of 3/16/94. All trademarks are property of their respective holders. Mobius, 5835 Doyle Street, Emeryville, CA 94608, (510) 654-0556.



Our 8th year selling quality drives at incredible prices.

30 Day money back guarantee.

Fast, friendly, and smart service.

Lifetime technical support.

24 Hour turnaround, 1 year replacement policy.

Thank you for your business!

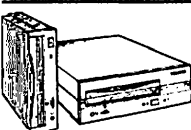


**SyQuest**

**INCREDIBLE SALE!**

- Complete External Subsystem Includes:
- Syquest drive in an external enclosure.
  - 2 year warranty on drive & case.
  - 1 Cartridge (1 year warranty)
  - 2 SCSI cables (25 to 50 & 50 to 50)
  - External plug in SCSI terminator.
  - Anubis (by Charismac) formatting software

**105MB \$369 270MB \$579**



**CD ROM DRIVE SALE!**

External CD ROM includes: External drive with external RCA jacks. SuperSpot driver with music play, terminator, and cable.

OSHIBA 3401, 200ms, Double Speed \$409  
 NEC CDR510, 195ms, Triple Speed \$499  
 NEC CDR900, 180ms, Quad Speed \$1029

## 1 GIG DRIVE SHOOTOUT!

WB Bechtel software used on Ili. PSR=Peak Sustained Read, SW=Peak Sustained Write, RT=Read Transactions/sec, WT=Write Transactions/sec, OI=Overall Index

#1 Quantum Empire 10805 1029MB  
 PSR=2823, PSW=2555, RT=581, RW=617, OI=5.7

#2 Conner CFP10605 1013MB  
 PSR=2778, PSW=2509, RT=775, WT=94, OI=5.6

#3 Seagate ST11200N 1006MB  
 PSR=793, PSW=793, RT=538, WT=93 OI=4.8

#4 Micropolis MC4110 1002MB  
 PSR=2561, PSW=2305, RT=532, WT=93, OI=4.7

#5 Fujitsu M2694ESA 1033MB  
 PSR=798, PSW=834, RT=549, WT=93, OI=4.7

## MICROPOLIS' NEW PRODUCT!

• Hard Drives specifically designed for enhanced digital video and audio performance in applications such as multimedia, desktop publishing, and video editing.

Capacity	Model	Internal	External
1000MB	MC2210AV	\$919	\$999
1700MB	MC2217AV	\$1229	\$1269
3000MB	MC1936AV	\$2199	\$2299

## HARD DRIVES

**Quantum**

**WE HAVE THE DRIVE YOU WANT AT AN UNBEATABLE PRICE!**



Capacity	Model	Internal	External
170MB	ELS170S	\$179	\$239
270MB	LPS270S	\$238	\$298
341MB	LPS340S	\$275	\$335
540MB	LPS540S	\$444	\$504
1080MB	EMP1080S	\$779	\$839
1800MB	PD1800S	\$979	\$1039

Capacity	Speed	RPM	Buffer	Brand	Warranty	Internal	External
105MB	19ms	4464	31K	Maxtor	1 Year	\$469 (Type III PCMCIA)	
170MB	17ms	3600	32K	Quantum	2 Years	\$179	\$239
240MB	16ms	4306	256K	Quantum	2 Years	\$249	\$309
240MB	14ms	4500	256K	Fujitsu	1 Year	\$329 (2.5" for Powerbook)	
270MB	12ms	4500	128K	Quantum	2 Years	\$238	\$298
340MB	12ms	4500	128K	Quantum	2 Years	\$275	\$335
540MB	9.5ms	5400	128K	Quantum	2 Years	\$444	\$504
1052MB	9ms	5400	256K	Seagate	5 Years	\$779	\$839
1052MB	8.5ms	5400	256K	Micropolis	5 Years	\$799	\$849
1060MB	9ms	5400	512K	Conner	5 Years	\$789	\$849
1080MB	9.5ms	5400	512K	Quantum	5 Years	\$769	\$829
1080MB	9.5ms	5400	256K	Fujitsu	5 Years	\$789	\$849
1690MB	8ms	7200	1024K	Seagate	5 Years	\$1459	\$1559
1750MB	10ms	5400	256K	Micropolis	5 Years	\$1169	\$1199
1800MB	10ms	4500	512K	Quantum	5 Years	\$979	\$1039
2145MB	8ms	7200	1024K	Seagate	5 Years	\$1689	\$1769
2148MB	9ms	5400	512K	Seagate	5 Years	\$1429	\$1529
3020MB	11ms	5400	256K	Micropolis	5 Years	\$2139	\$2169
9100MB	12ms	5400	512K	Micropolis	5 Years	\$4099	\$4199

Includes formatting software and cables.

## SYQUEST DRIVES

Capacity	Model	Speed	Buffer	Warranty	Internal	External
44 / 88MB	SQ5110C	20ms	32K	2 Years	\$379	\$445
105MB	SQ3105	14.5ms	64K	2 Years	\$309	\$369
270MB	SQ3270	13.5ms	128K	2 Years	\$519	\$579

Media Qty 1 / 5 88MB \$96 / \$89ea. 105MB \$58 / \$56ea. 270MB \$93 / \$89ea.

Includes 1 Cartridge, formatting software, and cables. Multiple Syquest drive towers in stock!

## CD ROM DRIVES

Brand	Model	Speed	Transfer	Type	Internal	External
Teac	CD-50	265ms	335KB/sec	Single disk	\$299	\$359
Toshiba	XM3401	200ms	330KB/sec	Single disk	\$349	\$409
NEC	CDR510	195ms	450KB/sec	Single disk	\$439	\$499
Pioneer	DRM-602X	300ms	307KB/sec	6 Disc Changer	n/a	\$919
Pioneer	DRM-604X	300ms	614KB/sec	6 Disc Changer	n/a	\$1169
Pioneer	DRM-1804X	300ms	614KB/sec	18 Disc Changer	n/a	\$2099

Includes driver software with music play, \$25 Photo CD processing coupon, and cables. Multi Drive CD Towers in stock!

## TAPE DRIVES

Capacity	Type	Brand	Speed	Internal	External
250MB	QIC 150	Archive	7MB/min	\$459	\$529
2Gig	DAT	Conner	11MB/min	\$839	\$899
2Gig	DAT	Hewlett Packard	12MB/min	\$959	\$1019
4-8Gig	DAT	Conner	88MB/min	\$1269	\$1329
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Includes Retrospect 2.0 (#1 backup software), 1 tape, and cables.

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Capacity	Speed	Brand	Cache	Feature	Internal	External
1.3Gig	32ms	NEC	1MB	MultiFunction	\$2439	\$2499
1.3Gig	19ms	Maxotix Tahiti III-4	4MB	MultiFunction	N/A	\$2799

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UTI 0322

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**FileDuo**—Backup your important files quickly and automatically! FileDuo creates backups any time you want: every 5 minutes, at a specific time, or when you shut down your Mac.  
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Publisher: American Small Business  
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Publisher: Software Ventures  
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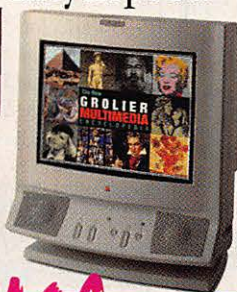
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520 MB	M2624 F/A 3.5" 9 MS, 5 Yr. War. Fast SCSI-2	565	625

1.2 GB	M2694 ESA 8.5MS, 5 Yr. War. Fast SCSI-2	825	885
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2.4 GB	New Price 5.25" 11 MS, 5 Yr. War. Fast SCSI-2	1385	1485
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1.7 GB	M2217	3.5" 10 MS, 5400 RPM FAST SCSI-2	1165	1225
2.4 GB	M1926	5.25" 11 MS, 5 yr. War. Fast SCSI-2	1420	1520
3.6 GB	M1936	5.25" 11 MS, 5 yr. War. Fast SCSI-2	2135	2195

Capacity	Model	Specifications	Int.	Ext.
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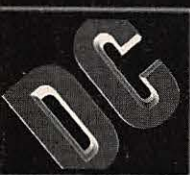
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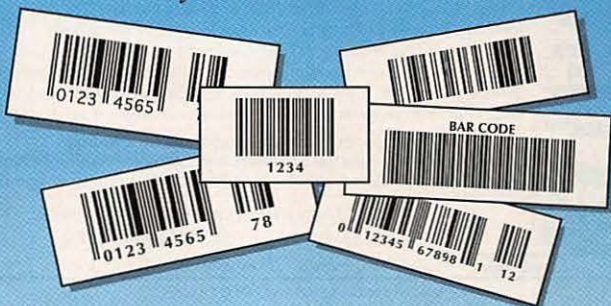
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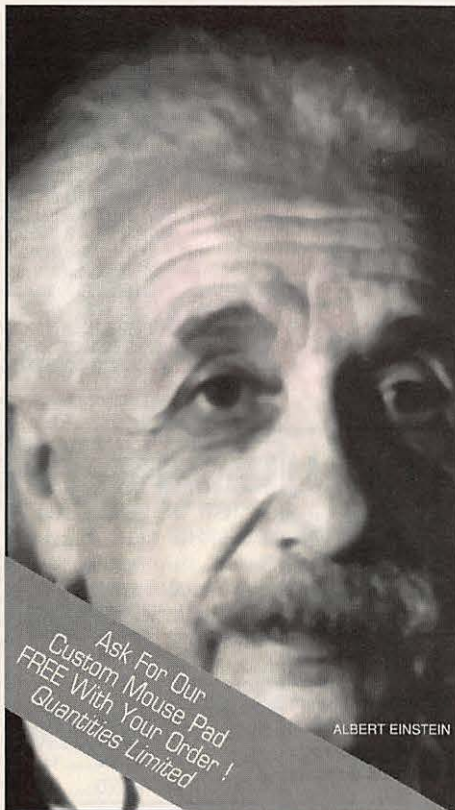
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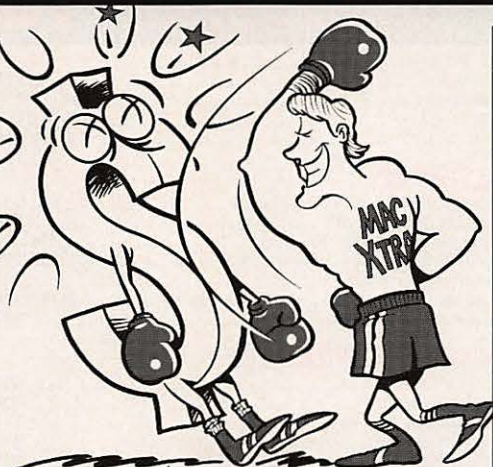
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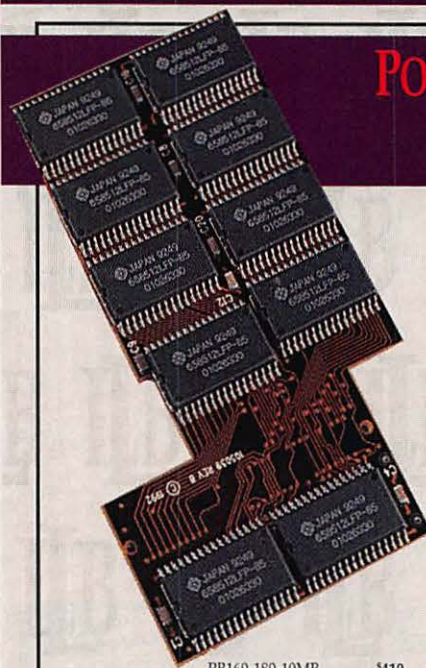
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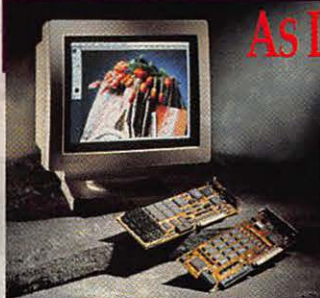
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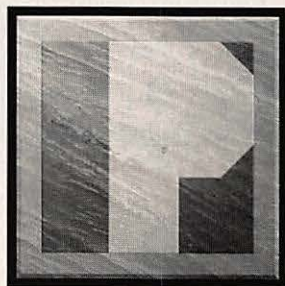
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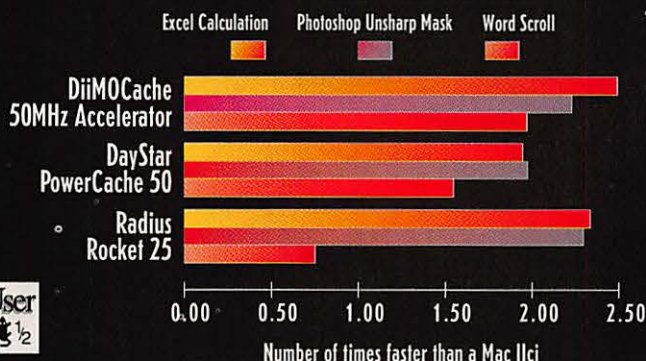
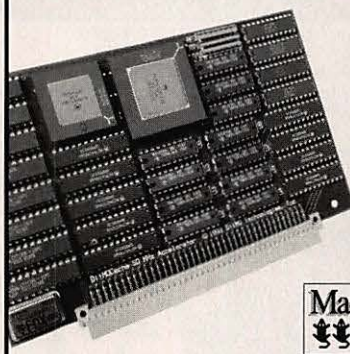
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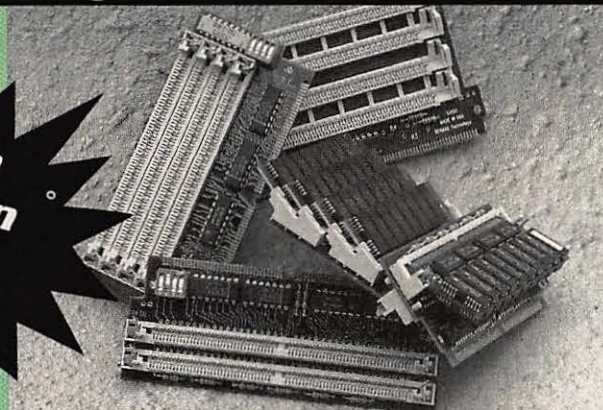
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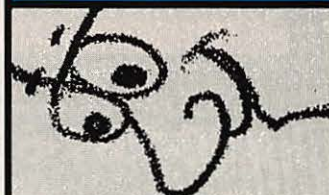
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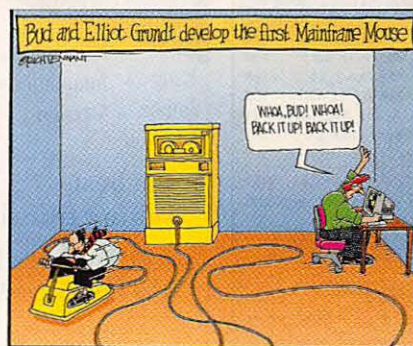
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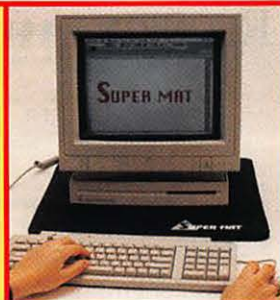
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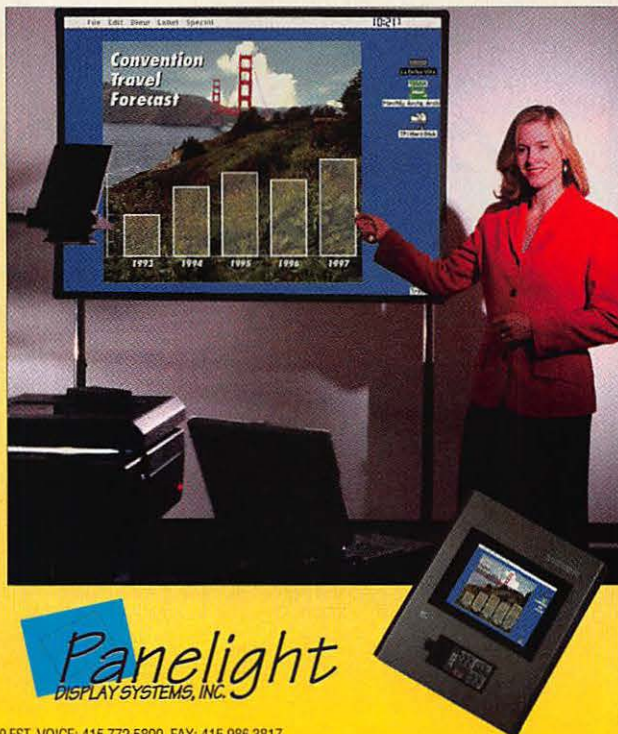
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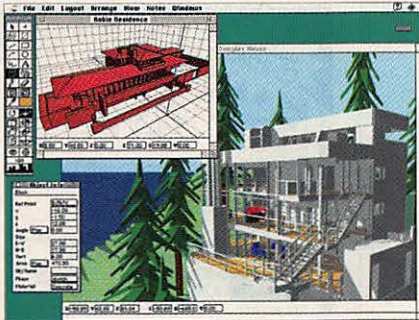
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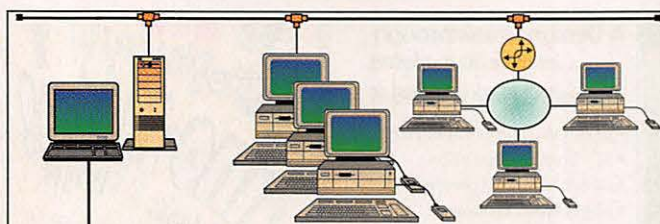
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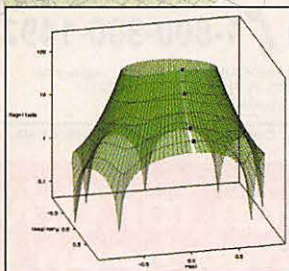
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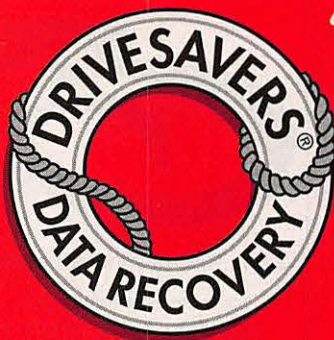
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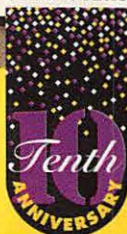
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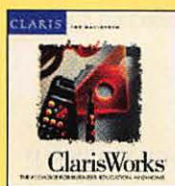
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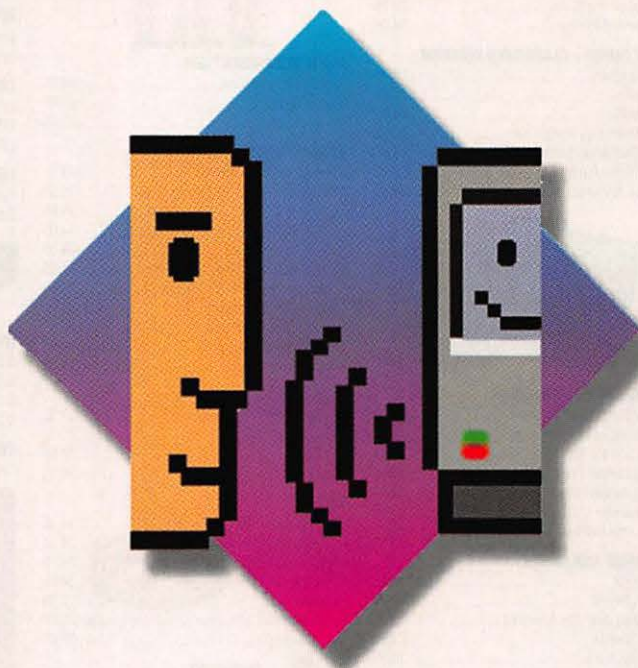


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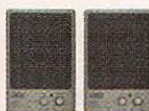
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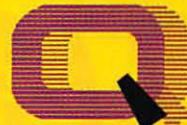


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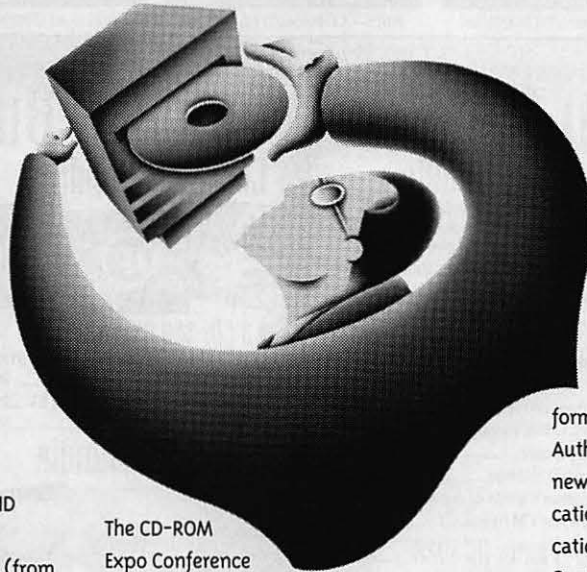
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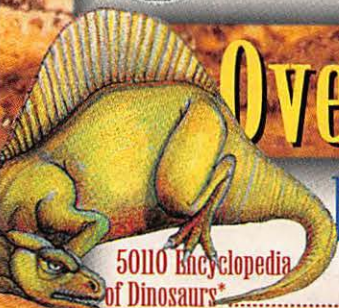
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WISE GUY

BY GUY KAWASAKI

# The Macintosh Home Office

*The myth and the reality*

**G**IVE ME A MACINTOSH, A laser printer, and a fax modem, and I'm ready to conquer the world. I don't need an office, support staff, and management. Like many Macintosh owners, I'm a home-office warrior. My commute is 30 seconds—45 seconds if I stop to get a cup of coffee in the kitchen. I set my own hours, and I don't attend staff meetings where people who don't care about anything have to listen to people who don't know anything.

I don't have to beg an MIS department to buy me a Macintosh; I can buy any Macintosh my wife lets me buy. Macintosh has made this all possible, and sometimes it seems like nirvana. But to be completely truthful, a lot of our starry-eyed visions about having a Macintosh home office are more myth than reality. Here's why.

## Plug and Pray

**Myth:** Macintosh does not require technical support. You go to your local computer store, select a Macintosh from the distinctly and clearly positioned product line with the help of a knowledgeable salesperson, take it home, open the box, plug, and play.

**Reality:** Plug and pray describes real life. I crash at least five times a day. Now StartUp is the utility I use most often, because I spend so much time tracking down INIT conflicts. Luckily I have a friend who spends half his day scanning bulletin boards for updates and patches for the software we use, and he provides me with technical support.

## Alone at the Top

**Myth:** Working at home with your Macintosh means you're isolated so you can concentrate on being more creative and productive. You aren't interrupted by coworkers, and you are not at the beck and call of a manager. You can sit at your Macintosh, completely focused, in Macintosh bliss.

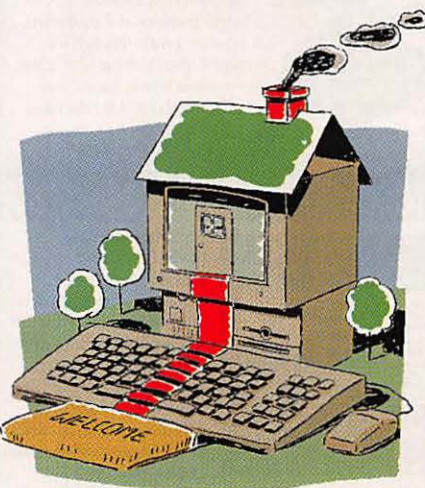
**Reality:** You can't concentrate on being more creative and productive. When your

Macintosh won't print, there isn't a Macintosh dweeb to find the LocalTalk connector that came undone. Simple tasks such as printing a label, stuffing an envelope, and licking stamps are now your problems.

Furthermore, Macintosh's alleged ease of use tempts you to make everything cooler. When you work for a big, dumb company, you dash off a memo in Times and Helvetica, and everyone is impressed by your laser output.

When you work at home, you decide to integrate graphics and QuickTime movies in your document because "it should work." It doesn't.

And let's face it, Macintosh users are gregarious types—who wants to be iso-



lated? If you've got E-mail, you don't have to be. I send my columns and books out electronically to a cadre of beta sites who are my harshest critics. I float column ideas on bulletin boards and troll for sources. I'm not isolated—in fact, because I check my four E-mail services 50 times each day, I'm inundated.

## PC Jr.

**Myth:** Since you're at home, you don't need day care for your children. Although this myth has little to do with using a Macintosh, it is a big part of working at home. Theoretically, working at home is the best of all worlds: bonding with your children, working in bliss, and saving the money you would have spent on day care.

**Reality:** You need day care more than ever, because Junior has only two states—crying and being adorable. Each of these states is more attention-consuming than a screen saver. Both states are unforeseeable. Both states are unavoidable. You wouldn't think of taking your child to an office without day care, so why would you do this at home?

If you think you can get away without day care, you probably think that a PowerBook battery lasts two hours. That PowerPC is compatible with your old software. That Bill Gates needs an IRA. That Guy Kawasaki thinks about anything but royalties.

## The Big Bucks

**Myth:** You make more money working at home. The advertisements tell you that a Macintosh home office is inexpensive: a computer, a laser printer, and some software—max, \$2500.

**Reality:** You discover you need more RAM. And an optional tray to print envelopes. And a fax modem. And a dedicated fax line. And a PowerBook. Soon you've spent \$5000.

Sure, as a Macintosh home-office warrior you can charge two or three times what a company pays an employee. However, when the dust settles, most people who work at home make the same as they would at a company, because they go nuts buying the latest Macintosh, laser printer, fax modem, cellular phone, beeper, stereo, and CDs—in the name of "enhanced productivity."

## On the Other Hand

These myths aside, I am not trying to discourage you from working at home; I'm providing a realistic perspective. But your worst day as a Macintosh home-office warrior will be better than your best day at a company you don't like. **m**

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. His latest book is *Hindsight* (Beyond Words Publishing, 1994). He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at [Kawasaki@radiomail.net](mailto:Kawasaki@radiomail.net).





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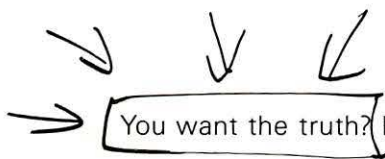
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← OK. It's fine print, but it's just trademark stuff. Honest.



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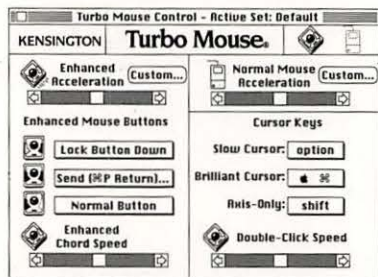
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